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### SOME ASPECTS OF RADIATION TREATMENT.[1]

By B. L. W. CLARKE, M.B., B.S. (Melbourne),
*Brisbane.*

WHEN dealing with the treatment of malignant disease there are three important facts to be considered: The gradual and steady increase of malignant disease, the great economic factor and the necessity to review and improve the present methods of treatment.

That there is a very definite increase in the number of sufferers from malignant disease cannot be denied and it is also very noticeable that the incidence of neoplastic disease is increasing as the numbers of other diseases of less economic importance are diminishing. Preventive medicine has been responsible for the control and even elimination of a number of infectious diseases. Side by side with this there has been an immense gain in our therapeutic knowledge, enabling us successfully to treat many maladies for which in the past we could do very little. It would be interesting to ascertain if facts like these are in any way responsible for the increased number of cancer patients.

Very little is known regarding the causation of cancer; many theories have been put forward, but up to the present no satisfactory explanation has been offered. Cancer may occur at any age; sarcoma usually occurs at the extremes of life, infancy and old age. On the other hand, continuous chronic irritation, such as sunburn, the action of certain chemicals like tar, and physical agents like X rays or radium are liable to cause cancer. In Queensland there is an enormous amount of skin cancer, which has been attributed to continuous exposure to the tropical and subtropical sunlight. This type affects those parts of the body exposed to

[1] Read at a meeting of the Queensland Branch of the British Medical Association on November 7, 1930.

the sun, that is, the skin on the face, neck and hands. It is uncommon to find these lesions present on that portion of the skin which is covered up by clothing.

Quite apart from the social problem, there is the economic aspect, because the individual is usually afflicted with cancer at the time of his greatest economic value, that is around the third, fourth and fifth decades of life; thus indirectly it affects his dependants as well, if the breadwinner of the family is deprived of his mode of livelihood. Even at the present time certain sections of the public believe that malignant disease is infectious; the very mention of the word cancer is sufficient reason for dismissal of an affected individual from his employment.

The cancer problem has now awakened world-wide interest, with the result that clinics and treatment centres have been established in many countries. In addition, research into the causes and treatment has been increased. In these clinics all known means of treatment are made available to rich and poor alike. At the present time radium appears to be our sheet anchor. Owing to its enormous cost (about £12,000 per gramme) and the multiplicity of forms in which it is required for the different types of lesions, the most efficient method by which it may be made available is undoubtedly the establishment of centres which cater for the treatment of all types of malignancy.

### Types of Neoplasm.

Time does not permit a discussion on the various pathological types of neoplasms. For the purpose of treatment and prognosis they may be divided into certain types, as follows: (i) Locally malignant neoplasms having (*a*) slow spread, (*b*) rapid spread. (ii) Malignant neoplasms characterized by (*a*) early metastases, (*b*) late metastases. (iii) Neoplasms which may be (*a*) radio-sensitive, (*b*) radio-resistant.

In the first group may be included rodent ulcers, in the second group the various types of breast cancer, whereas in the third group there is the contrast between lymphosarcoma and melanotic sarcoma. The latter is notoriously resistant to X rays, radium and, in fact, all forms of treatment.

### Treatment.

The treatment problem is very complex. It is an old saying that prevention is better than cure. In those types for which we believe we know the cause, such as sun cancer, so prevalent in Queensland, a great deal can be done by educating the public to avoid the cause, that is, to protect the exposed parts of the body from over-exposure to the sun's rays, by wearing hats with large brims and wearing a neck covering of some type. If Nature had her way, the majority of us would have long hair and beards to protect us from excessive exposure to the sun. The next problem is to educate the public to recognize neoplastic disease in the early stages. Many cures have been effected by early treatment.

The early diagnosis of cancer is very difficult owing to the complete absence of pain. There is no symptom like pain to force a person to seek early advice and treatment. The early recognition of cancer is at present limited mainly to lesions on those parts of the body which may be inspected with the naked eye. The officers of the various cancer clinics are issuing information setting out some of the early signs and symptoms of internal neoplasms; they are hopeful that much good will result and that people will be encouraged to have the symptoms investigated early. It is not infrequent to be consulted by a patient suffering from an advanced inoperable neoplasm, yet he will say that there was some sign present long before and that it was disregarded. It must also be realized that there are times when a physician has been consulted and he has failed to recognize the nature of the lesion. Lastly, there are some types of neoplasm which fail to respond to any type of treatment, no matter how early they are recognized. In this class may be included melanotic sarcoma as a typical example.

At the present time our methods of treatment are confined to diathermy, surgery, X rays and radium. Treatment by chemical means, such as colloidal lead, appears to have given benefit in the hands of some workers. When called upon to treat a neoplasm it is our duty to maintain an open mind, review each case on its merits and realize the limitations of any proposed therapy.

#### *Diathermy.*

Diathermy may be used to destroy keratoses on the face, forehead, neck and hands; I am of the opinion it can be used with very successful results on rodent ulcers of the forehead, neck and lower portions of the nose, but I consider it is of little value in the treatment of malignant lesions on the face or lips, as the local lesion only is destroyed and metastases are left untreated. Diathermy still has its advocates and many good results of this method of treatment can be shown. Diathermy does not as a rule cause much scarring.

#### *Surgery.*

For a great many years surgery has provided the chief means of treating cancer, but the big question arises, has it been successful? It cannot be denied that surgery has given relief of symptoms in numerous instances, but has it been the means of permanently curing cancer? Surgery in the treatment of carcinoma of the breast has now been practically standardized, but upon comparison of the results of the present surgical methods of wide excision of the breast tissues and extensive glandular dissections with the earlier method of excision of the tumour only, we are still confronted with either local recurrences in the scar or distant metastatic manifestations.

I have recently seen two patients who have suffered from what may clinically be considered an early cancer of the breast, confirmed by biopsy, return six years later one with metastases in the axilla and the other with metastatic carcinoma in the lumbar spine and pelvis; in each case the primary lesion appeared cured.

In early cases of carcinoma surgery appears to offer the best chance of cure, provided, of course, the primary excision is sufficiently wide; cutting across a tumour so often causes a rapid progress of the neoplasm that I consider it should not be encouraged. Surgical sectioning of tumours for the sake of accurate diagnosis is very often followed by rapid progress of the disease when it is generalized. It is better to excise the whole tumour widely beyond its margins than to cut across a neoplastic nodule. If this cannot be done, it is better to regard the disease as malignant and apply treatment accordingly. There is no doubt that in early cases surgery offers excellent chances of cure of malignant disease; in the late stages, such as in carcinoma of the gastro-intestinal tract, it is the only means of providing relief. Between the early and the advanced cases of malignant disease seen in any routine practice there are many intermediate types; these are not cured by surgery alone. Then again, consider the possible mutilation brought about by extensive surgical operations. We must decide whether it is worth while mutilating and disfiguring a patient if a reasonable prospect of cure or relief cannot be brought about.

In addition to surgery there are two very powerful and potent agents which in recent years have done a great deal to alleviate the symptoms of cancer. They are radium and X rays, and of these two latter agents radium in many cases supersedes X rays.

### *Radium.*

Radium is one of the radio-active elements in the same chemical group as thorium, mesothorium and certain other rare elements. It has some very definite characteristics, such as emission of certain types of rays, known as "alpha," "beta" and "gamma" rays. These rays will fog a photographic plate, cause fluorescence on an X ray screen, which may be observed in the dark, and exert very definite changes on living tissue cells. In actual practice for the purpose of treatment we rely on the $\gamma$ ray; the $\alpha$ ray is of comparatively long wave length and is easily absorbed by a centimetre of air or a sheet of note paper. Therapeutically it is useless. The $\beta$ ray is of shorter wave length, but for practical purposes it is too caustic, causing burning and destruction of the skin and the other superficial tissues. Nevertheless, it has its usefulness in the treatment of some lesions, such as superficial rodent ulcers and hyperkeratoses.

For therapeutic purposes radium is most often used in the form of the salt, radium sulphate.

Radium treatment may be applied in several forms, the most common being as follows: (i) Plaques may be applied superficially to a lesion. (ii) Needles may be driven into and around the neoplastic tissues — interstitial radiation. (iii) Tubes containing large quantities of radium can be inserted into cavities such as the uterus. (iv) Moulds, made of wax, which are impregnated with radium needles are used for treatment at a distance of several centimetres from the skin. In this method the $\beta$ rays are filtered out and the $\gamma$ rays only reach the deeper structures. (v) Emanation or radon seeds are made by collecting radio-active gases or emanations in suitable containers. They are inserted and left in the neoplasms. (vi) "Bomb" treatment consists of the application of a large amount of radium (up to one gramme) to specific areas for a certain limited time.

Owing to the great cost of radium at the present time "bomb" treatment is not practicable, unless the distributing centre possesses large quantities of radium. It remains yet to be seen whether this method has any special advantages over the more common methods of radium therapy, such as moulds or distance radiation, burial of needles or interstitial radiation therapy.

Bergonie and Tribondeau have formulated the law that the sensitivity of cells to radiation is in direct proportion to the reproductive activity of the cells.

The effects of radium on body cells and tissues may be summarized under three headings, as follows:

1. *Destruction of Tissue.*—Tissue destruction was the first known effect of radium on tissue; it showed the possibilities of radium therapy. Regaud has subdivided this destructive action into two types: a diffuse cyto-caustic and a selective cyto-lethal action. The former is really a radium burn; necrosis is produced in all tissues affected without any selectivity and is caused by feebly penetrating rays acting for a sufficiently long period. In the latter, that is, cyto-lethal action, the effect is obtained from an equal quantity of radium, suitably screened to cut off the $\alpha$ and $\beta$ rays and allowing the $\gamma$ ray to bring about its selective action. The action of these rays is not limited to the superficial layers, but affects the deeper tissues as well.

2. *Inhibition of Cell Activity.*—The inhibitory action of radium has been established definitely, both by histological studies of irradiated tissue and by observations on cultures *in vitro*. There is substantial proof in various clinical manifestations.

3. *Stimulative Effect.*—It has been asserted that insufficient dosage of radium may cause a stimulative or excitatory effect upon the cells.

### *X Rays.*

X ray therapy is very similar in its action to radium. It may produce destructive lesions of tissue, cause an inhibition of cell growth or perhaps even stimulate the cell activity if insufficient dosage is given. X rays, to be of value in the treatment of cancer, must be penetrative in nature, that is, of sufficiently short wave length as to give, as far as possible, a homogeneous radiation to the deeper structures. In order to bring about this effect, they are produced at a high voltage (about 200,000) and in front of the tube are placed various types of filters to cut out or absorb the rays of longer wave length, corresponding to the $\alpha$ and $\beta$ rays of radium. In certain types of lesions X ray therapy is prefer-

able to radium, for instance, in the treatment of bone neoplasms.

At the present time there is some scepticism about X ray treatment. This may be due to poor results obtained by the use of rays of insufficient penetrative power or lack of knowledge of filtration; if filtration be not properly carried out, there may be no effect on the tumour, but very often the skin may be affected in such a way that it loses its elasticity and becomes fibrous, or even breaks down and ulcerates. At the present time these difficulties have been largely overcome. It is very often difficult to maintain a homogeneous radiation, as we are dependent on an electric supply which may fluctuate, variations in the types of therapeutic X ray tubes *et cetera*. Radium possesses this advantage, that, once efficiently screened, the rays are homogeneous, whereas X rays are more or less heterogeneous.

*Skin Cancer.*

I now propose to deal with the lesions which we are most often called upon to treat. The commonest is skin cancer; in this group I will include rodent ulcers. The skin of the anatomical head and neck is most frequently involved. In the treatment of these lesions, uncomplicated by metastatic manifestations, the application of radium, whether in the form of plaques, moulds or distance radiation, or interstitial needling, is the most effective therapeutic measure we possess; the lesions respond in a gratifying manner; at the conclusion of treatment, beyond some slight scarring, there is very little evidence of the previous existence of the lesion.

In the rodent ulcer group it is uncommon to observe metastatic involvement of glands, unless the lesion is of very long standing. The spread is mainly by direct infiltration, involving any structure which may attempt to impede it. In my opinion interstitial needling is the most effective and most economical method of treatment. The needles can be left *in situ* for several days, the duration of the patient's confinement to hospital can be fairly accurately gauged, and the action on the neoplasm is usually effective.

In the treatment of epithelioma of the lip and tongue the application of radium is remarkably effective. Here again interstitial needling of the growth and surrounding tissues causes rapid disappearance of the lesion without, in many cases, much scarring or disfigurement. In dealing with epitheliomata of the lip and tongue it is important to bear in mind the necessity for attending to metastases and affected glands; also the possibility of the occurrence of late or delayed radiation effects should not be forgotten.

Frequently patients are observed who have received successful local treatment for epitheliomata of the lip or tongue, but whose cervical glands, having received no attention at the time, have steadily enlarged, although the original lesions have healed.

In all these cases the neck glands should receive appropriate treatment. If the glands are not already showing signs of enlargement, it occurs to me that surgical treatment is of little value, as lymphatic channels are cut across and the malignant cells are scattered during surgical manipulation. If the glands are enlarged and movable, they may be removed surgically, but here again the lymphatic channels are severed. If glands are enlarged and fixed it is doubtful if surgical excision is of any value. In my limited experience I have seen many instances of recurrent metastatic growths after surgical excision of epitheliomata of the lip or tongue, together with the glands of the neck; they occur with most frequency within the first year. I am of the opinion that results equally good, in fact better, can be obtained by X ray or radium therapy to the neck. Radium is applied in the form of radium collars or, in selected cases, interstitial implantation of radium needles; the whole glandular and lymphatic drainage area of the neck is thoroughly treated. If surgery of the neck is attempted, it should be followed up by radiation treatment to the whole of the lymphatic drainage area. These statements may conflict with the opinions of many surgeons, but they are based on observations made in public hospital practice, where a follow-up system is very effective in ascertaining the end results of our efforts in the treatment of these conditions.

The late effects of radiation treatment must also be borne in mind. Radium and X rays alike may destroy the elasticity of tissues which subsequently become fibrous; contraction of fibrous tissue results in impairment of vascularity, leading possibly to breaking down and necrosis or to the development of telangiectasis which is really a manifestation of nature's efforts to bring about a collateral circulation. Telangiectasis is very unsightly and may be a cause for subsequent legal action. Radiation necrosis is notoriously difficult to treat; very often plastic surgery must be resorted to and owing to fibrous change and altered conditions of the tissues, this may be very difficult.

Late necrosis of bone is occasionally seen after X ray and radium applications. It may not develop for a number of years. I have under observation now a patient who was treated by surgery and the application of X rays nearly seven years ago for an epithelioma of the lip, apparently successfully; there is no sign of recurrence, but lately he has developed a large sequestrum in the mandible.

At this stage mention may be made regarding dental extractions in the course of malignant disease. It cannot be doubted that the elimination of septic teeth is of value, but there are two factors to be considered. If the treatment is not likely to be successful, removal of the teeth will not only be valueless, but will add to the disability and suffering of the patient, as he will now be deprived of the possibility of enjoying a variety of food. Secondly, the fitting of dental plates in a malignant mouth is not only difficult, but, on account of the structural changes, it may act as an irritant and cause a recurrence of the growth. Many public

hospital patients have had septic teeth for many years and are probably auto-immunized. Another fact is that tooth extraction has been responsible for the implantation of the original lip or tongue cancer into the dental socket of the jaw.

*Carcinoma of the Cervix.*

The majority of cervical carcinomata seen by the radiotherapeutist are inoperable or nearly so. The last hope lies in radiation. It is really surprising how many apparently hopeless conditions can be relieved temporarily at least or even apparently cured. It is not my intention to quote statistics; they are available in many publications.

The implantation of radium in or around the mass, each patient being treated according to her individual needs, causes a marked regression of the tumour, with lessening of the ulceration and cessation of hæmorrhage. Care must be exercised in the application of radium, as in these cases it is a very easy matter to cause an excessive reaction, with subsequent fistula formation between the rectum or bladder and vagina. On the other hand, many of these advanced lesions already have infiltrated the bladder wall and a fistula will form in any event, providing life is sufficiently prolonged.

The vaginal mucous membrane is very sensitive to radium. If excessive doses are used an inflammatory reaction is set up; when it subsides dense adhesions follow which make any subsequent operative or radium therapy extremely difficult.

As it is very difficult efficiently to irradiate the whole cervix, uterus and lymphatic drainage areas, I consider that X ray therapy should be used to supplement radium. Many excellent results have been obtained by these means in apparently hopeless cases.

In all types of malignant disease, if the lesion is early, surgery has a high position in effective treatment, more especially in early carcinoma of the uterus in which there is no macroscopical or microscopical evidence of metastases or infiltration.

*Carcinoma of the Breast.*

There are many varieties of carcinoma of the breast, some of which appear to remain locally malignant, others of which have metastases, early or late. If the tumour is localized, not extensive and freely movable, surgery should be resorted to in the first place, preferably supplemented by radiation therapy either before or after operation. There is at present some difference of opinion as to whether radiation should be given before or after operation or both. Frequently though the breast itself is removed and an extensive excision of the axillary glands is carried out, enlarged glands develop in the lower cervical region. These glands are nearly always affected by metastases; from the neck the spread down into the mediastinum rapidly follows. A patient of another type complains of lumbago or rheumatism some years after the original operation; investigation reveals that she is suffering from metastases in the lower dorsal or lumbar spine, pelvis or hip joints. I have on several occasions seen bone metastases in the femur or humerus, but cannot recall any patients with metastases distal to the knee or elbow joints. In patients with late bone metastases, there is rarely seen any evidence of recurrence around the original scar or in the axillary or cervical glands.

The only patients I have treated by radium or X rays without surgery, except one, have been deemed inoperable by the surgeon and the results have been so gratifying that I believe radium may be successfully used for treatment in the earlier stages.

One effect of successful radiation therapy of the local lesions in advanced cases of carcinoma is the remarkable metastatic manifestations, such as have occurred in several cases under my observation, in the skull, for instance, in a case of cancer of the breast and one case of uterine carcinoma.

Whether X rays or radium be used in the treatment of breast cancer, care must be exercised owing to the effect of the rays on the pulmonary tissue and the pleura. Heavy doses of X rays applied at right angles to the pectoral wall have been responsible for fibrotic pulmonary changes and chronic pleural thickening, with or without effusion. This condition adds considerably to the discomfort of the patient.

Patients subjected to heavy radiation therapy may develop radiation sickness, which is characterized by malaise, rise in temperature and a gastro-intestinal disturbance. Usually the effects do not last more than forty-eight hours, but if very severe may cause considerable alarm. The treatment is mainly symptomatic and the administration of copious fluids, for preference mildly alkaline.

*Bone Sarcoma.*

Sarcoma of the bones is by no means uncommon. In this group there are considerable difficulties in diagnosis, as any surgical interference usually results in a stimulation of the primary lesion. The patient, usually under thirty years of age, is affected by a swelling, perhaps painful, which is progressive in nature. Radiological examination reveals bone changes which tend to confirm the diagnosis. I am of the opinion that all of these conditions should be regarded as malignant, the affected limb should be placed at rest and deep X ray therapy relied upon. Surgical intervention, even to amputation through the hip joint or shoulder joint, as the case may be, has not so far given very good results. On the other hand, I have seen many cases in which section of the tumour for biopsy and accurate diagnosis has rapidly proved fatal, either on account of local recurrence or pulmonary metastases. Many successful results in the treatment of bone sarcoma by radiologists may be severely criticized on the ground that no biopsy was made; but here we have to decide whether we will act in the interests of science or in the interests of the individual.

Apart from the cystic types of bone tumour which are nearly always benign, and whose treatment is essentially surgical, there are two main types of

bone neoplasms: (i) Sarcoma, which is always primary in origin. (ii) Carcinoma, which is always secondary to a cancer lesion elsewhere, such as cancer of the breast, prostate *et cetera*.

In the treatment of both of these types the X rays are preeminent, causing an alleviation of pain and an inhibition of the pathological process followed by bone repair. Radium therapy of bone tumours so far has not been nearly as successful as X ray treatment.

### Summary.

In summing up the position at the present time one may say that radium gives the best results in the treatment of skin cancers of all types, epithelioma of the tongue and lip and carcinoma of the cervix. On the other hand, deep X ray therapy gives the best results in the treatment of bone neoplasm, primary sarcoma or secondary carcinoma; in addition, the immediate effect upon such diseases as lymphosarcoma, Hodgkin's disease and hypernephroma is most remarkable. By means of careful administration of the dose these patients can be kept alive and are of economic value to the community for a number of years.

Combined X ray and radium and surgical treatment is, I consider, the best means of applying treatment to uterine carcinoma. Up to the present no satisfactory results have been obtained in the radiation treatment of any of the neoplasms involving the gastro-intestinal tract. Some secondary sarcomata of the lung, following upon bone neoplasms, will respond temporarily to X ray treatment. After effects of radiation treatment must always be borne in mind. Excessive doses will cause fibrotic change in the skin and subcutaneous tissues and, in many cases, complete obstruction of the lymphatic channels.

There are many patients at present who have been apparently cured of malignant disease, who have had a considerable amount of radiation treatment to the groin. Lymphatic obstruction has followed in later years. The same may occur after the application of treatment to the neck and the axilla.

I have attempted to discuss some only of the more common lesions which we are asked to treat. There are many others of less frequent occurrence which time will not permit me to discuss.

In conclusion, I may say that we have a great deal yet to learn about the treatment of malignant disease.

## SOME NOTES ON THE DEVELOPMENT OF THE ARMY MEDICAL SERVICES.

By F. KINGSLEY NORRIS, M.D.,
*Melbourne.*

REFERRING to the Campaign against the Moors in 1480, Prescott in his "History of Ferdinand and Isabella" wrote:

> Isabella caused a number of large tents known as the Queen's Hospitals to be always reserved for the sick and wounded and furnished them with the requisite attendants and medicines at her own charge.

In a letter of the time, Peter Martyn, an Italian scholar, has left this impression:

> The camp hospitals of the Queen are so profusely supplied with medical attendants, apparatus and whatever may contribute to the restoration or solace of the sick that they are scarcely surpassed by the magnificent establishments of Milan.

This is an account of the earliest attempt at the formation of a regular medical service.

William III introduced some form of field ambulance into the British Army, but as Cumberland marched relentlessly north a few years later to crush all Stuart hopes and incidentally the clan system at Culloden, he left behind him many sick soldiers. While most regiments were accompanied by a surgeon, there was no provision of transport or accommodation for the many casualties. The soldier who fell out on the march from fatigue, pneumonia or dysentery, dropped quietly out of sight from the day when he crawled or was carried into some cottage or hovel and there left to recover or to die. Officers fared little better. If the soldier recovered in some way, he regained his regiment or he deserted. If he died and if he was an officer, his name was reported to the War Office, but the name of a non-commissioned officer or private was never reported before 1793; he was included in a nameless number of casualties and he passed away with no further ceremony. Sometimes the local leech would be called in to treat the sick man and would render his account to the government concerned. Found among the papers belonging to Cumberland's Army is such a bill presented by David Brodie, Physician, of Elgin, for professional attendance on George Recuby, of Cobham's Dragoons (now called the Tenth Hussars), "left in a country village dangerously ill on April 16 (1746)," the day of the battle of Culloden.

| | | | s. | d. |
|---|---|---|---|---|
| April | 16. | To a bleeding | 1 | 0 |
| | | A box of pectoral linctus | 1 | 0 |
| | | A pectoral mixture | 1 | 6 |
| ,, | 17. | A glass of febrifuge drops | 1 | 0 |
| | | A pound of cooling mixture | 1 | 6 |
| | | A blistering plaster | | 6 |
| | | 2 lb. of pectoral infusion | 1 | 6 |
| ,, | 24. | 2 lb. of emulsion | 1 | 0 |
| ,, | 25. | Do. repeated | 1 | 0 |
| ,, | 26. | The same | 1 | 0 |
| ,, | 30. | 4 lb. white decoction | 2 | 0 |
| | | 4 doz. febrifuge powders | | 9 |
| | | To wine to make seck whey, sugar milk, barelay, rice, tea, and other nourishment furnished him from 16 April to 1 May | 7 | 0 |
| | | Paying for a coffin and mort cloth and to the grave-digger | 7 | 0 |
| | | | £1 | 7 | 9 |

*N.B.*—Any cloaths that this man had lyes in a village called Oldmilns; his landlady took his money out of his pocket, which she says was only six shillings, and says she expended it on aquavitæ, which I am persuaded hurt him.

The Peninsular campaign under Wellington would seem to have been served or rather neglected along similar lines. Rowlandson's drawing of an invalid officer lying on the floor of a wretched Portuguese

cabin attended by his drunken soldier servant is well known. In Spain, Wellington lost ten times as many men from disease as from battle, and more in one winter's encampment without any fighting than in the whole of the previous summer's campaign.

There is a popular tradition that Napoleon's ghastly defeat in the final Russian campaign was due to the devastation of the country by fire and sword allied to the snows of Generals January and February. In spite of the historical snowclad pictures of that retreat, his army crossed the Beresina in November. A raging storm of typhus contributed to the decimation of the army, and again it was pestilence, not powder, that decimated his army at San Domingo and prohibited any attempt at an American invasion.

In the ground of the Royal Army Medical College facing towards the Tate Gallery is a weather-stained statue to Sir James McGrigor. The gentleman of this stalwart name filled the office of Director General of Medical Services for some thirty-six years continuously until he retired from the Service about 1850 with the vision of an Army Medical Corps unrealized.

And so things muddled along until the time of the Invasion of the Crimea in 1854. It is necessary to dwell on the Medical Service of this campaign; it was the turning point in the history of our organization. Surgeon Sir A. D. Home has written a delightful reminiscent book, "Service Memories." As a young man he went to the Crimea as a regimental surgeon. Later he was to win the Victoria Cross in the Indian Mutiny. Conditions had improved since Waterloo. One bell tent was allotted to each regiment for hospital needs, but there was no medical equipment. The sick men lay on the ground; if they had their coats, they were covered; if their coats were lost, they shivered. There was no special wheeled transport for wounded in the whole of the war area. The army originally possessed two four-wheeled wagons to serve the needs of the wounded, but on embarkation at Varna, some officers' horses were considered to have prior claim to the deck space and the wagons were bundled on shore again; there they remained and rusted through the campaign. I think we have all met those officers. General Home witnessed the memorable charge of the Light Brigade. The first Victoria Cross awarded to a medical officer was won by Surgeon Mouat of the Sixth Dragoons on this occasion for distinguished gallantry in "dressing the wounds, arresting hæmorrhage and thus saving the life of Major Morris in a very exposed position in front of the enemies' guns just after the charge." The Light Brigade was fortunate in possessing two folding canvas stretchers carried by the farriers in front of them as they rode. It was months after the war began, after the Battle of Alma, before more than one thousand beds were provided at the base Scutari, the Asiatic suburb of Constantinople. It is impossible to dissociate the base hospitals at Scutari from the name of that gracious Lady of the Lamp, Florence Nightingale. After tremendous opposition from the War Office, Miss Nightingale was sent out more or less officially to play at nursing the sick soldiers. To quote rather lengthily from Lytton Strachey's cameo of this lady in his "Eminent Victorians":

> At Scutari, the landing stage, constructed with all the perverseness of Oriental ingenuity, could only be approached with great difficulty, and in rough weather not at all. When it was reached, what remained of the men in the ships had first to be disembarked, and then conveyed up a steep slope of a quarter of a mile to the nearest of the hospitals. The most serious cases might be put upon stretchers—for there were far too few for all; the rest were carried or dragged up the hill by such convalescent soldiers as could be got together, who were not too obviously infirm for the work. At last the journey was accomplished; slowly, one by one, living or dying, the wounded were carried up into the hospital. And in the hospitals what did they find? Want, neglect, confusion, misery—in every shape and in every degree of intensity—filled the endless corridors and the vast apartments of the gigantic barrack house, which, without forethought or preparation, had been hurriedly set aside as the chief shelter for the victims of the war. The very building itself was radically defective. Huge sewers underlay it, and cesspools loaded with filth wafted their poison into the upper rooms. The floors were in so rotten a condition that many of them could not be scrubbed; the walls were thick with dirt; incredible multitudes of vermin swarmed everywhere. And enormous as the building was, it was yet too small. It contained four miles of beds, crushed together so close that there was but just room to pass between them. Under such conditions, the most elaborate system of ventilation might well have been at fault; but here there was no ventilation. The stench was indescribable.

"I have been well acquainted," said Miss Nightingale, "with the dwellings of the worst parts of most of the great cities in Europe, but have never been in any atmosphere which I could compare with that of the Barrack Hospital at night." The structural defects were equalled by the deficiencies in the commonest objects of hospital use. There were not enough bedsteads; the sheets were of canvas, and so coarse that the wounded men recoiled from them, begging to be left in their blankets; there was no bedroom furniture of any kind, and empty beer-bottles were used for candlesticks. There were no basins, no towels, no soap, no brooms, no mops, no trays, no plates; there were neither slippers nor scissors, neither shoe brushes nor blacking; there were no knives or forks or spoons. The supply of fuel was constantly deficient. The cooking arrangements were preposterously inadequate, and the laundry was a farce. As for purely medical materials, the tale was no better. Stretchers, splints, bandages—all were lacking: and so were the most ordinary drugs. Miss Nightingale came, and she, at any rate in that inferno, did not abandon hope. So dreadful was the neglect of efficient medical services that in two years 1,700 men were killed or died of wounds, while 17,000 died of disease, one to ten. Cholera alone accounted for 4,500 deaths. Florence Nightingale returned to England, and her heroic and lonely fight against this disgrace dragged on. Her notes affecting the health, efficiency and hospital administration of the British Army comprise eight hundred closely written pages. She was directly responsible for the establishment of the first Army Medical School at Netly. She struggled and fought fiercely against dreadful opposition, but she won through and laid the foundations of all our modern army medical organization. The foundation charter of the Royal Army Medical Corps was embodied in a Royal warrant issued in 1857:

Whereas we have deemed it necessary to constitute a new corps of attendants in our military hospitals for the better care of the sick and wounded soldiers of our Army, our will and pleasure is that a corps shall be forthwith raised for this purpose.

By Her Majesty's command,
Panmure.

So, strangely, we owe our medical service to two women, the energetic, martial Isabella of Castille and the inflexible Florence Nightingale.

The first concrete improvement was the sending out of London's most famous chef of the day, Monsieur Soyer. One can imagine this autocrat of Piccadilly instructing the regimental cooks in dealing with the Army food of the time. He has left his name with us to this day in the Soyer field oven.

The Geneva Convention in 1864 was the direct outcome of the Crimean Campaign and the battle of Solferino.

The old order or disorder rapidly changed. In the list of officers attached to Kitchener's Staff in the Sudan Campaign we note the Medical Service has two representatives, Surgeon-General Taylor and Lieutenant-Colonel Gallway, and each brigade had its own Principal Medical Officer.

In the South African War the Medical Service was highly organized, but the Cinderella of the army, the hygiene service, was well in the background, or rather right out of the ground altogether. As a result the deaths from disease still greatly outnumbered the deaths from wounds, but the field ambulance as organized today is a creation of the South African War.

The importance of army hygiene had to wait another two years for recognition, and of all lessons from the Russo-Japanese War none is more impressive than the results of the first attempt at organized army sanitation. The whole Medical Service of the Japanese Army was interesting. Each battalion had two medical officers, but there was no brigade service. Each division possessed one bearer battalion, five hundred to six hundred strong (6% fighting troops) under the charge of an infantry major, which carried wounded to the various aid posts and dressing stations. Attached to each division was a sick and wounded transport department under an infantry major, for transport to the divisional hospitals. There was one dentist to each army. In quarters or on the lines of communication all drinking water was boiled in large rice cauldrons. In the field alum and lime were generally used. Through the campaign there was at least one monthly lecture to all troops on sanitary precautions, and every officer and man as a routine three times a day with his meals took a creosote pill containing one and a half grains of creosote as a prophylactic against intestinal disease. As a result of these various measures the ratio of deaths from disease to deaths from wounds fell to 0·3 to 1, a fraction for the first time in the history of the world. The Russian Medical Service was almost Gilbertian in many respects. The chief medical officer of the Russian Army was the Adjutant-General, and there was complete separation between the administrative and professional duties. Doctors were only doctors, not soldiers, and had no disciplinary powers. The Red Cross Service played a large part in providing the medical personnel, and there was gross lack of coordination between this organization and the Army Medical Service. In the course of the campaign one dentist was appointed to the armies, but on second thoughts his appointment was cancelled and a meteorologist was sent out instead. However, his prognostications proved no more reliable than those of his kind and he was recalled.

Many are familiar with the medical organization in the Great War, but few have realized what was achieved. Gustavus Adolphus once broke camp and started on his spring campaign two months earlier than he had intended, simply for fear that, if he waited in camp until summer, he would have no army left. Our armies in Flanders and northern France in the winter of 1917–1918, in open trenches in the vilest weather, had less sickness and fewer deaths from all diseases than soldiers used to have in barracks in time of peace and far less than the civil population at home. According to the prevalence of typhoid fever in previous campaigns we should have had 20,000 deaths a year on the British western front alone. Actually during four years among 3,000,000 men there were only 260 deaths. Such was the team work of surgeon, ambulance and nurses that of the wounded who reached the base 98% recovered. On the standard of the Crimean campaign, barely sixty years previously, the medical organization of the Great War resulted in the magnificent saving of at least 400,000 lives yearly.

**Acknowledgement.**

I am indebted to the assistance of Colonel R. M. Downes in the preparation of these notes.

## PUNCTATE BASOPHILIA: A METHOD FOR EASY DEMONSTRATION BY DARK GROUND ILLUMINATION.

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One of the important criteria of the diagnosis of lead poisoning is the demonstration, by microscopic examination, of the presence of stippled red cells in the blood of the subject. These cells are found in the mildest forms of plumbism and may be very numerous in the more severe forms. Stippling of red cells may also be found in patients exposed to benzol and its derivatives or carbon monoxide and in munition workers exposed to trinitrotoluene. Progress in the technique for demonstrating this phenomenon has been chiefly in the direction of improving staining methods. Recent methods have brought under notice a fine grade of stippling which had hitherto been missed. There still remains considerable difficulty in finding and counting the affected cells by microscopical examination.

During the search for an easy method of demonstration, it was discovered that it is possible to find stippling in the red blood cells of apparently normal people not exposed to any of the hazards

mentioned. Accordingly, in view of the possibly far-reaching effects on the diagnosis and compensation of certain industrial diseases, the present intention of the writer is merely the presentation of observed facts. Before drawing conclusions, a great deal of further investigation is necessary in this matter.

During the course of an investigation into blood changes in workers in trinitrotoluene, of four hundred and seventy-four blood films stained by Leishman's method, on examination only three revealed stippling. In view of the fact that trinitrotoluene may act as a poison towards the blood-forming organs, it was thought that modifications of the technique used hitherto might show that basophilic stippling was actually more common than the above figures suggested.

Aub, Fairhall, Minot and Reznikoff[1] found that the ordinary modified Romanowsky stain may not bring out the basophilic granules even when stippled cells are present, and that it was necessary to overstain so that films have a blue tinge. Sellers,[2] as a result of his investigations of punctate basophilia in lead workers, recommends an alkaline methylene-blue stain. This stain was used by Mathew[3] at Port Pirie for routine examinations of blood films from lead workers. It was used almost exclusively in the present work. Careful examination of blood films stained by this method gave better results than when Leishman's stain was used. In addition, a very fine type of basophilic stippling, which had previously escaped notice, was found in most of the films. Sellers[2] in this connexion says:

> The writer cannot examine more than three films in an hour, and cannot do more than four hours' work in one day. The work is laborious and trying to the eyes, owing to the fact that many punctate cells contain excessively fine granules. Probably many discrepancies are caused by the occurrence of such finely granular forms, for they are easily missed.

Mathew[3] also draws attention to the fine type of stippling. He says:

> In the presence of a predominance of medium granular cells many cells of the finely granular type may have escaped notice.

In common with other workers, the writer found blood-film examination for stippling very fatiguing, and time-consuming. In casting about for a better method, it was decided to try what results could be obtained by dark ground illumination of the stained films. Early results exceeded expectations. In the hope that other workers in this field will benefit by the use of this method, the writer ventures to present his findings to date. So far, he has not been able to find in the literature examined by him evidence that dark field illumination has been used for routine examination for stippling in red blood corpuscles.

### Apparatus.

Microscope: A binocular microscope with a mechanical stage was used.

Objective: A "Zeiss" apochromatic oil-immersion objective of numerical aperture "1·0" was found to be the best for the purpose. This objective is made especially for dark field work and is fitted with an integral iris diaphragm, so that the aperture may be reduced if necessary.

Oculars: Compensating eye-pieces of ten magnifications were used.

Condenser: A "Siedentopf change-over condenser," made by Zeiss, fulfilled all requirements. In this condenser provision is made for the observer, by moving a lever, to change from bright to dark field conditions, or *vice versa*. A tinted ground glass, built into the condenser, prevents dazzle when the bright field is used with the arc lamp.

Lamp: An arc lamp, preferably clock-work driven, is required to give the best results with the "Siedentopf change-over condenser." A "Zeiss" arc lamp was used with the direct current. The lamp is fitted with an iris diaphragm, aiding one in rendering the dark field as black as possible.

### Methods and Results.

When observing a stained blood film by means of the dark field method, the leucocytes first attract notice because of the way in which they are lit up. The normal erythrocytes, on the other hand, appear structureless and their appearance resembles bright rings on the black ground. When, however, granules are present within the corpuscle, as in punctate basophilia, bright particles appear, scattered throughout the cell. Bright objects on a dark background are more readily seen than dark objects against a bright field. This is particularly noticeable when the objects in question, basophilic granules, are very tiny. The ordinary oil-immersion objective used in examining blood films under the usual bright field conditions has a short depth of focus, and, unless one is constantly refocussing, fine stippling, when present, is apt to be overlooked. By use of the dark field one is not so liable to miss the tiny granules through inaccurate focussing.

Cells with diffuse polychromatophilia are often not easily seen. Under bright field conditions, in a film stained either by Leishman's or Giemsa's method, such cells have a bluish appearance, in contrast with the red colour of the other erythrocytes. While it is difficult to see any granules in some of the polychromatophile cells, most cells of this type examined by means of the dark field are observed to have a fine grade of stippling identical in appearance with that found in many cells stained by Sellers' method. Examination of these, by means of bright field illumination, merely reveals a deeper staining, and differentiation cannot be made with certainty. By means of the dark field, they are easily recognized as finely stippled cells.

Many workers draw attention to the difficulties in counting stippled cells in a blood film examined in the ordinary way. The relative numbers found by different and experienced observers of the same film with the same microscope depend on several factors, including acuity of vision, time spent, care in focussing and the thickness of the portion of the film examined. If the dark field method be used, results should be more accurate for the reasons advanced.

Comparative counts, by means of bright field and dark field illumination, were made of the stippled cells occurring in blood films stained by Seller's method from eleven individuals.

The apparatus described above was used for counting stippled cells when the dark field method was used; for counting under ordinary bright field conditions, a separate microscope with an apochromatic oil-immersion objective of "1·3" numerical aperture was used with artificial illumination. The numbers given in Table I refer to the numbers of stippled cells per million red cells.

TABLE I.

*Showing the Numbers of Stippled Cells per Million Red Cells.*

| Film Number. | With Bright Field Illumination. | With Dark Field Illumination. |
|---|---|---|
| 1 | 500 | 2,500 |
| 2 | 100 | 3,000 |
| 3 | 0 | 1,500 |
| 4 | 3,000 | 6,000 |
| 5 | 600 | 1,000 |
| 6 | 600 | 3,400 |
| 7 | 0 | 1,700 |
| 8 | 0 | 700 |
| 9 | 200 | 2,900 |
| 10 | 0 | 2,000 |
| 11 | 0 | 0 |

These results are quoted merely to show that many more stippled cells were found by the dark field than by the ordinary method.

The dark field method of counting the stippled cells in blood films stained by Sellers' method was applied to the examination of three different groups of workers. Care was taken to confine attention to the portions of the films which were one cell thick. It was estimated that there were three hundred red cells per field. Thirty fields in each film were examined. In the first column of Table II the total number of stippled cells found per million red cells is given, and in the second, third and fourth columns, the percentages of the various types of stippled cells are graded according to the fineness of the stippling as seen by means of the dark field illumination.

The finest grade of stippling observed by means of the dark field does not appear as stippling when the film is examined by means of the bright field, but the cells in which it occurs differ from the non-stippled cells in appearing more deeply stained. Coarse stippling is readily seen under bright field conditions, while the fine type is apt to be overlooked. The last can be detected by careful focussing, particularly if the cell in which it occurs has been previously located by the dark field method.

As stippled cells were found in each of the films from the nine trinitrotoluene workers, control batches from two other groups were examined in the same way. In none of these was there any reason to suspect the absorption of trinitrotoluene, of lead, or any other substance known to cause basophilic stippling of red cells. In addition to trinitrotoluene workers, other groups examined were civil servants reporting to the Commonwealth Medical Officer for various illnesses of an "everyday" character, and a group of apparently healthy male indoor workers.

TABLE II.

*Numbers of Stippled Cells found in the Blood Films of Trinitrotoluene Workers by Use of Dark Field Illumination.*

| Film Number. | Number of Stippled Cells per Million Red Cells. | Percentage with Coarse Stippling. | Percentage with Fine Stippling. | Percentage with Finest Stippling. |
|---|---|---|---|---|
| 1 | 1,550 | 44 | 28 | 28 |
| 2 | 5,500 | 12 | 48 | 40 |
| 3 | 2,800 | 19 | 24 | 57 |
| 4 | 2,200 | 10 | 30 | 60 |
| 5 | 200 | 0 | 50 | 50 |
| 6 | 3,100 | 27 | 28 | 45 |
| 7 | 100 | 0 | 0 | 100 |
| 8 | 1,800 | 31 | 57 | 12 |
| 9 | 440 | 25 | 50 | 25 |

The net results arrived at by examination of the two control groups show that basophilic stippling of red cells cannot be relied upon at the time as evidence that the trinitrotoluene workers are absorbing trinitrotoluene. On the findings, basophilic stippling would appear to be a commonplace amongst

TABLE III.

*Numbers of Stippled Cells found by Dark Field Illumination in the Blood Films of Civil Servants reporting to the Commonwealth Medical Officer.*

| Patient Number. | Occupation. | Complaint. | Number per Million Red Cells. | Percentage with Coarse Stippling. | Percentage with Fine Stippling. | Percentage with Finest Stippling. |
|---|---|---|---|---|---|---|
| 1 | Cleaner | Lumbar fibrositis | 300 | 33 | 33 | 34 |
| 2 | Linesman | Sciatica | 1,000 | 10 | 40 | 50 |
| 3 | Linesman | Bronchitis | 1,200 | 20 | 50 | 30 |
| 4 | Mail Officer | Hyperpiesis (blood pressure 224 mm.) | 4,600 | 17 | 40 | 43 |
| 5 | Mechanic | Tonsillitis | 880 | 37 | 50 | 13 |
| 6 | Mail Officer | Influenza | 500 | 22 | 17 | 61 |
| 7 | Mail Officer | Injured knee | 0 | 0 | 0 | 0 |
| 8 | Telegraphist | Neurasthenia | 0 | 0 | 0 | 0 |
| 9 | Carpenter | Strained back | 300 | 0 | 66 | 34 |
| 10 | Mail Officer | Exfoliating dermatitis | 1,500 | 6 | 47 | 47 |
| 11 | Telegraph Messenger | Gonorrhœa (vaccine treatment) | 7,200 | 40 | 30 | 30 |
| 12 | Linesman | Shell shock neurasthenia | 300 | 0 | 33 | 67 |
| 13 | Linesman | Abrasion | 2,500 | 48 | 17 | 35 |
| 14 | Linesman | Sciatica | 3,300 | 23 | 33 | 44 |
| 15 | Engineer | Œdema of leg | 0 | 0 | 0 | 0 |
| 16 | Mechanic | Carbuncle on forearm | 1,800 | 35 | 24 | 41 |
| 17 | Assistant | Eustachian blockage, deafness | 2,300 | 28 | 34 | 38 |
| 18 | Clerical | Colles's fracture | 770 | 14 | 43 | 43 |
| 19 | Clerical | Coryza | 660 | 16 | 16 | 68 |
| 20 | Linesman | Disordered action of heart | 1,100 | 10 | 60 | 30 |
| 21 | Surveyor | Cerebral arteriospasm | 550 | 20 | 20 | 60 |

workers in the two control groups. All grades of stippling were found in the three groups of workers, and, in addition, cells of a mixed type with both fine and coarse granules.

TABLE IV.

*Numbers of Stippled Cells found by Dark Field Illumination in the Blood Films of Apparently Healthy Indoor Workers.*

| Film Number. | Number per Million Red Cells. | Percentage with Coarse Stippling. | Percentage with Fine Stippling. | Percentage with Finest Stippling. |
|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 |
| 2 | 660 | 0 | 66 | 34 |
| 3 | 330 | 0 | 34 | 66 |
| 4 | 0 | 0 | 0 | 0 |
| 5 | 1,200 | 0 | 55 | 45 |
| 6 | 2,700 | 12 | 52 | 36 |
| 7 | 2,800 | 20 | 40 | 40 |
| 8 | 0 | 0 | 0 | 0 |
| 9 | 1,800 | 12 | 32 | 56 |
| 10 | 100 | 0 | 0 | 100 |
| 11 | 200 | 0 | 0 | 100 |
| 12 | 200 | 0 | 50 | 50 |
| 13 | 1,300 | 8 | 38 | 54 |
| 14 | 200 | 0 | 50 | 50 |
| 15 | 100 | 0 | 0 | 100 |
| 16 | 770 | 0 | 60 | 40 |
| 17 | 200 | 0 | 0 | 100 |
| 18 | 4,400 | 15 | 35 | 50 |
| 19 | 1,800 | 23 | 41 | 36 |
| 20 | 1,500 | 14 | 43 | 43 |

### Errors of Interpretation when the Dark Field Method is Used.

The brightly refractile bodies scattered through the stippled cell can scarcely be misinterpreted. Confusion between these and other bodies in no way related to the cell is not likely to arise, because, when the dark field method is used, a stippled erythrocyte has an appearance which is quite characteristic. At first glance small lymphocytes have a slight resemblance to stippled cells, but, by changing over to the bright field, one soon learns to distinguish between the two at a glance.

Another possible source of error would be the presence of something analogous to "Cupp's normal reticulum" quoted by Paul, Friedländer and McCord.[4] They say:

> It is possible, therefore, that the marked discrepancies that have been obtained in different investigations of reticulated cells in human beings may in part be due to the inclusion, in reticular enumerations, of some cells showing Cupp's form of reticulation which have been brought into visibility through hæmolysis.

This possibility was investigated in the present work; but it was found that cells hæmolyzed with distilled water or with formalin and acetic acid did not present the appearances of stippling when fixed and stained and viewed by means of the dark field. Further evidence that this was not a likely source of error in these observations is deduced from the facts that no stippling was found in "ghost" cells, and that in some films stippled cells were so few in number as to be negligible, or were absent altogether.

Stippling could not be demonstrated in unfixed films, nor in those fixed but unstained. Staining as well as fixing was required to demonstrate basophilic stippling by the dark field method.

### Disappearance of the Basophilic Granules from Stippled Cells.

Films should be examined within a few hours of preparation. If this precaution be not observed, one may be unable to demonstrate stippling, owing to partial or complete loss of this characteristic. After an interval of a week between the spreading of films and their fixation and staining, the number of stippled cells found amounted to fewer than twenty-five *per centum* of the number in the control films examined within a few hours of preparation. The cells with the finest stippling are the first to lose that characteristic. The coarser granules lose their bright appearance and appear degenerated, when stained, but are distinguishable for a longer period than the finer kinds. In films prepared according to Sellers' method, the stippling disappears, but not so quickly as in unfixed films. Dr. E. V. Keogh, of the Commonwealth Department of Health, in a personal communication, stated that he had also noted the same changes in lead workers' blood films stained by Sellers' method.

### Findings in the Three Groups of Trinitrotoluene Workers, Civil Servants Reporting for Illnesses, and Indoor Workers.

(1) Basophilic stippling was found in the blood films of: (*a*) Nine or 100% of nine trinitrotoluene workers; (*b*) eighteen, or 86% of twenty-one civil servants reporting to the Commonwealth Medical Officer for various illnesses; (*c*) seventeen, or 85% of twenty apparently healthy indoor workers.

(2) More than one thousand stippled erythrocytes per million of red blood corpuscles were found in: (*a*) Six, or 67% of the trinitrotoluene workers; (*b*) nine, or 43% of civil servants reporting for illness; (*c*) eight, or 40% of apparently healthy indoor workers.

(3) The coarse type of stippling characteristic of ordinary punctate basophilia as seen by bright field illumination was found in: (*a*) Seven, or 78% of the trinitrotoluene workers; (*b*) sixteen, or 76% of civil servants reporting for illness; (*c*) seven, or 35% of apparently healthy indoor workers.

(4) The distribution of the three types of stippled cells in each group of workers was as shown in Table V.

TABLE V.

*Percentages of Types of Stippling seen in the Blood Films of Three Groups of Workers.*

| Persons Examined. | Coarse Stippling. | Fine Stippling. | Finest Stippling. |
|---|---|---|---|
| Trinitrotoluene workers .. .. | 18·7% | 35% | 46·3% |
| Civil servants .. .. .. | 21% | 36·3% | 42·7% |
| Indoor workers .. .. .. | 6·1% | 35% | 58·9% |

### Summary and Conclusions.

(1) The use of dark field illumination in the microscopic examination of blood films for evidence of punctate basophilia is described.

(2) The dark field method is far less fatiguing and time-consuming than bright field methods in counting stippled cells in blood films.

(3) Attention is drawn to the importance of examining films in a fresh condition.

(4) Although the comparatively small number of films examined does not permit the making of sweeping generalizations or dogmatic statements, it would appear that the following conclusions are justifiable:

(*a*) Punctate basophilia, as demonstrated by this method, was found of frequent occurrence in workers not apparently subjected to any single common cause of this condition.

(*b*) Punctate basophilia was present in a large number of those workers, and in a significant proportion of red blood corpuscles.

(*c*) A number of workers with trinitrotoluene was examined, and similar changes demonstrated.

(*d*) The high stippled cell counts found in cases of disease hitherto unsuspected of being accompanied by punctate basophilia, indicate the need for further investigation in this direction.

(*e*) In view of the unexpectedly high percentage of persons in whose blood evidence of stippling may be found by the dark field method, it would appear that in any individual case the significance of this change as evidence of trinitrotoluene or lead absorption is questionable.

**Acknowledgements.**

I wish to thank the following: Dr. F. G. Morgan, Director, Laboratories Division, Commonwealth Department of Health, for his sustained interest and advice; and Dr. H. E. Downes, Commonwealth Medical Officer in Melbourne, for supplying blood films.

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## MODERN THERAPEUTICS.[1]

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I HAVE to thank you for the honour you have done me in asking me to speak before your association. I am aware that I shall not be able to put before you much, if anything, that is new, but I shall discuss some matters in which we have all been interested of late.

[1] Read at a meeting of the Western Medical Association, New South Wales, June, 1930.

### Vitamins.

We are in the midst of a vitamin craze. A great deal of work is being done concerning vitamins and you are all familiar with the antirhachitic vitamin *D* and the anti-infective vitamin *A*, as well as the antiscorbutic and pellagra preventing factors. I can see no reason why Australian people should not eat a diet which will render them safe from vitamin deficiencies without having recourse to the drug shop. Milk, butter, eggs, fresh meat and fresh vegetables should be available to all, if they will use them. In childhood, however, there is no doubt that vitamin *D*, in the form of cod liver oil, is frequently a necessary addition to the diet, mainly where incorrect feeding has been adopted. Mellanby has pointed out the value of this substance in preventing dental caries in children and we have very frequent evidence of its value in ill nourished or rickety children between the ages of six months and four or five years. At present it appears to be generally agreed that irradiated ergosterol (vitamin *D*) itself is not so efficacious as cod liver oil in these conditions.

In regard to vitamin *A* which Mellanby showed to have a value in preventing infections in rats and apparently also in puerperal septicæmia, I have not heard of any confirmatory evidence of such an effect in Australia, though I know the treatment has been tried. At any rate such treatment or prophylaxis of infections can do no harm and may do good.

It is now known that vitamin *D* is necessary for calcium metabolism and bony hardening in childhood; rickets is largely a condition of imperfect bone formation.

### Calcium Metabolism.

Recently light has been thrown on calcium metabolism by the development of an active parathyreoid hormone, the administration of which increases the blood calcium in a way that oral administration cannot effect.

Blood calcium is diminished in tetany, a spasmodic condition which occurs when the parathyreoid glands are extirpated. It is rare. It also occurs in children in association with rickets, gastro-intestinal disorders *et cetera*, and it is thought that spasmodic conditions of childhood, such as *laryngismus stridulus*, carpo-pedal spasm and even convulsions, may be associated with deficient blood calcium. In such conditions the administration of six grammes (100 grains) of calcium lactate per day, by itself or with parathyreoid hormone, is recommended, in addition to the treatment of the primary condition. Tetany in the adult is certainly controlled by such measures.

Similar treatment is advised in obstructive jaundice for several days before operation, if surgery is necessary, in order to lessen the coagulation time of the blood, which is always prolonged in such conditions; ten to fifteen units of parathyreoid hormone every thirty-six hours for three days is the dose. This substance has been found useful also in hæmoptysis, *post partum* hæmorrhage, menor-

rhagia and in hæmorrhage after nose and throat operations.

It is an interesting fact that in uræmia associated with twitchings or convulsions, the blood calcium is diminished in some cases; and in nephritis with œdema or in nephrosis calcium chloride in doses up to eleven grammes a day may promote diuresis. It may be that parathyreoid hormone *plus* calcium by mouth (if possible) might relieve the uræmic twitchings or promote diuresis.

#### Acidosis.

In acute and chronic nephritis, when the urine is highly acid, alkalis such as potassium or sodium citrate or sodium bicarbonate in doses from 1·2 to 4·8 grammes (twenty to eighty grains) a day, may markedly relieve symptoms; I have known the general health to be greatly improved by this means, especially if an effervescing saline is given before breakfast. A similar good effect by giving alkalis has been recorded lately in early stages of scarlet fever. Whether this is due to an effect on an acidosis in these conditions, I do not know. It has been said that the greatest danger patients with nephritis run is that some doctor will find it out and treat them for it.

To return to acidosis. Some degree of acidosis, that is, decrease of plasma bicarbonate, occurs in debility following acute illnesses, in late stages of chronic nephritis, diabetes, tuberculosis, severe anæmia, shock, overwork, hysteria, obesity, chill, severe burns and other conditions.

In childhood up to puberty, with the occurrence of any unfitness there is a tendency for the plasma bicarbonate to fall below the normal. We are all familiar with the frequency of acidosis in childhood, the fruity odour is detected in association with vomiting, gastro-enteritis and many acute illnesses. In adults the plasma bicarbonate is less unstable, but it has been shown to be definitely decreased during menstruation and in many cases of amenorrhœa associated with debility. Acting on this fact Osman recently treated a number of non-pregnant women in whom amenorrhœa was a symptom and who were debilitated without localized disease. Alkalis were given in the form of 1·5 grammes (25 grains) each of potassium citrate and sodium bicarbonate in 45 cubic centimetres (one and a half ounces) of water three times a day for three weeks or more, with the result that menstruation occurred in the majority of them. A complaint of swelling of the feet, hands and abdomen was made by many of these patients (a common symptom among women) and it was suggested that this symptom might be attributable to the acidosis commonly found and might be relieved by alkalis.

In acidosis glucose also may be found helpful, though other carbohydrates will usually overcome acute acidosis satisfactorily (sugar, orange juice *et cetera*). Glucose is an easily absorbed food and it may be given with benefit in many conditions where other foods are not readily taken. In acute illness or in convalescence from acute illness 4% solution may be given by mouth in large amounts. Bennett and Dodds showed in 1925 that up to 500 grammes of glucose may be ingested without any ill effect. I have used it with considerable benefit in children who did not pick up quickly after bronchopneumonia and other acute illnesses. A more concentrated solution than 4% can generally be given when the patient is found to tolerate it well. In acute infections and malnutrition of any kind its use is worth considering, and in heart failure it is regarded as a useful food and a diuretic.

The administration of glucose and insulin is another form of treatment for chronic wasting conditions, say, ten to fifteen grammes of glucose preceded by five units of insulin twice a day. Remarkable gain in weight may follow the use of this treatment in the wasting of hyperthyreoidism and in tuberculosis.

#### Hyperthyreoid Conditions.

In regard to hyperthyreoid conditions, I presume the use of small doses of iodine or iodide is now a standard treatment. In practically all non-malignant thyreoid enlargements or as a prophylactic measure in goître districts, iodine has a very useful field. Lugol's solution (iodine 5%, potassium iodide 10% and water 85%), five to twenty drops three times a day, is the preparation most used now, but good effects can be obtained with iodide of sodium in doses of 0·03 to 0·12 gramme (half grain to two grains) three times a day. For prophylaxis smaller doses are sufficient. Treatment with iodine is not so effective and may even increase the symptoms in toxic adenoma of the thyreoid.

#### Other Methods of Treatment.

There are a number of methods of treatment in a variety of conditions which have been advocated and which I have tried personally, to which I should like to allude.

In hypertension Allen found a marked effect on omitting salt from the diet; others have not confirmed his results in full, but such restriction has a limited use. Many drugs have been advocated for reducing blood pressure. Veratrone five to twenty drops three times a day certainly does good in some, but it is not constant in action; "Anabolin" (a liver extract) and acetylcholine will also reduce blood pressure, but their action appears to be related to that of histamine and to be due to a toxic effect on the organism, hence the wisdom of using them is doubtful. I would lay special stress on the importance of excluding thyreotoxicosis as a cause of hypertension.

In regard to diabetes nearly every patient sooner or later asks about the value of prickly pear and other plant extracts, vinca, myrtillon *et cetera*; none of these has been found to reduce the blood sugar consistently. "Synthalin," a German preparation in the form of attractive-looking pink pills, does reduce blood sugar, apparently by a toxic effect on the liver (it is closely allied to guanidine); for this reason it has not come into general use.

There is a drug which has a marked effect in promoting diuresis in the œdema of heart failure, in ascites, and in fluid collections not associated with nephritis; I speak of "Novasurol" or "Salyrgan"; half to one cubic centimetre given intramuscularly coincidently with 1·2 grammes (twenty grains) of ammonium chloride by mouth three times a day eliminates fluid, if the kidneys are sound. These drugs contain mercury and may cause transient diarrhœa or have toxic effects on the kidneys, if these organs are not sound. Another drug which has been very widely advocated is quinidine in cardiac irregularities, especially auricular fibrillation. After a fairly extensive trial of ths drug I confess that in my hands it has not justified my expectations, and I am sure great caution should be exercised in its use. In *angina pectoris* I have lately noted a good effect from the use of "Diuretin."

In epilepsy "Luminal" and bromide given at the same time are more effective than any other method of drug treatment, 0·03 to 0·06 gramme (half to one grain) of "Luminal" twice or thrice daily in tablet form and one gramme (fifteen grains) of a bromide salt in a mixture three times a day, or larger doses at night in nocturnal epilepsy.

Recently a high fat and low carbohydrate diet has been advocated in epilepsy, a ketogenic diet as it is called; its aim is to cause ketosis or acidosis, in which condition the fits are said to be lessened.

In post-encephalitic disorders, of which Parkinson's syndrome, simulating *paralysis agitans*, is the most common, tincture of stramonium in doses of one to four grammes (fifteen to sixty minims) thrice daily alone or with hyoscine hydrobromide 0·43 milligramme (one one-hundred-and-fiftieth of a grain) three times a day appears to give some relief. Some years ago Hall claimed a similar effect for belladonna, but my experience of that drug was not impressive, even in reducing salivation, which is sometimes very troublesome in *paralysis agitans* and the post-encephalitic state.

Ephedrine in asthma you have doubtless used considerably; it is effective in some cases, but variable in its effect and soon loses its value if frequently used, as does adrenalin in such cases. So much has been said about the medical treatment of gastric and duodenal ulcers by means of a graduated diet and alkalis that it may seem superfluous to mention the subject. I should like to say that in my hands such treatment has proved very effective, especially if the patient be put at rest for two or three weeks at the beginning and providing that the alkalis are given frequently enough and for long periods; the dose at bedtime is important, and I think olive oil is useful as a food as well as by inhibiting the action of the acid gastric juice.

Another use of olive oil which I have cribbed from a doctor who has had a gastro-enterostomy performed, is in preventing discomfort after meals in such cases; fifteen to thirty cubic centimetres (half to one ounce) of olive oil after meals causes the gall bladder to empty itself and relieves the feelings of distension and bilious vomiting on which alkalis have no effect.

No doubt you are all familiar with the good effect of scarlet fever antitoxin. It is used at the Coast Hospital now in the more severe cases.

There are some uses of thyreoid extract which may be worth mentioning; in nocturnal enuresis it is often a valuable addition to belladonna treatment. Thyreoid treatment also has often been followed by conception in previously barren women (as long as ten years). It stimulates the endocrine glands generally. I recall a patient with myxœdema who had three children after a lapse of ten years as a result of treatment with thyreoid.

Thyreoid is also useful as a glandular stimulant in undescended testes (late) associated with a eunuchoid condition, and in hypopituitary conditions of childhood; it is used in conjunction with pituitary dried whole gland in these states. I have been very interested to note a recovery from severe hysterical conditions in women when they have become pregnant, and attributed this to the glandular changes which are so obvious at that time, but I have never been able to produce a similar effect either with thyreoid or mixed gland treatment, probably because the mixed endocrine products are generally inactive.

Thyreoid is also very effective in some cases of high blood pressure, particularly in pale, obese people without definite signs of nephritis.

On the subject of hypodermic stimulants in pneumonia and other acute disorders, camphor, adrenalin, strychnine, pituitrin and other substances are variously advised on different grounds. I incline to the opinion that all may have some effect in improving the patient's condition, though perhaps the effect on the heart may not be the main one.

## Reports of Cases.

### PURPURA HÆMORRHAGICA.

By Edgar H. Stephen, M.B., Ch.M. (Sydney),
*Honorary Physician, Royal Alexandra Hospital for Children; Clinical Lecturer in Medical Diseases of Children, University of Sydney.*

These are the notes of two cases in which there were diminution in the number of blood platelets, extensive extravasations and resulting gangrene.

The more recent case ended fatally six days after purpura had appeared. The patient was a boy aged two and a half years. He had been discharged from hospital eight days before. His complaint had been difficulty in defæcation associated with screaming attacks. While in hospital there was no repetition of these attacks. He was circumcised for the relief of phimosis and seemed in good health.

It may be that these were symptoms of Henoch's purpura. Cases have been reported as Henoch's purpura in which abdominal crises have occurred some days before purpuric lesions were evident.

On the morning of September 8, 1930, a purpuric area encircling the left leg was noticed. A less extensive area then appeared on the right leg and smaller extravasations

on both thighs. Next day the left leg and foot were blue and cold, the condition proceeding evidently to gangrene. There was an extravasation involving half the extent of the pinna of one ear; both eyelids were similarly affected. The day before death there was hæmaturia.

The bleeding time on September 9, 1930, was seven minutes at room temperature (the normal is one and a half to two and a half minutes). The blood platelets numbered 79,500 per cubic millimetre of blood (the normal is 300,000). On September 11, 1930, the platelets numbered 24,500 per cubic millimetre.

In this disease blood transfusion is the only known aid in saving life, but the 250 cubic centimetres (eight fluid ounces) of citrated blood this patient received did not avert a fatal ending.

The other patient, also a male, was aged four and a half years. The appearance of purpura had occurred one week after the crisis in an attack of pneumonia and three days prior to his admission to hospital. At the time of his admission one foot was blue and cold; it eventually became gangrenous. An area of skin over the knee subsequently sloughed and there were purpuric areas on the back, both arms and the other leg. There had been bleeding from the mouth and nose, but no blood appeared in the urine or fæces. Extravasation appeared in the pinna of one ear and sloughing eventuated.

This boy had a severe anæmia. The red corpuscles numbered 2,125,000 per cubic millimetre, the white corpuscles 40,000 of which 87% were polymorphonuclear cells. The blood platelets numbered 206,500 per cubic millimetre at the time of his admission and 50,868 on November 11, 1927, some days after admission. After a blood transfusion and a somewhat stormy passage his platelets had increased on December 13, 1927, to 539,500 per cubic millimetre.

The leg was amputated on November 24, 1927, the patient requiring but little anæsthetic for the mere severance of tibia and fibula. On January 12, 1928, it was necessary to perform skin grafting on a bare area over the knee.

This boy has been seen from time to time since; examination of his blood has revealed a consistently normal number of platelets.

His blood condition was evidently determined by a toxin from the pneumonic infection.

## POISONING BY ARSENIC.

By J. K. D. MACKENZIE, M.B., B.S. (Melbourne),
*Glenthompson, Victoria.*

IN January, 1930, in a neighbouring village, I was called in to see a woman suffering from persistent headaches, frequent fainting attacks, vomiting, mostly in the early morning, shooting pains of great intensity in the legs and difficulty in walking. The husband had suffered similarly some twelve months previously, but had slowly recovered. Routine examination revealed a peripheral neuritis. There was no papilloedema; nothing abnormal was revealed by examination of the urine; the blood did not react to the Wassermann test. The patient also had very brittle nails and her hair was rapidly falling out.

Subsequently I noted that the house roof was painted and discovered that this had been done two years previously with "pyrites" paint. This is made from a purplish pigment as basis, obtained from old mine dumps, its chief virtue being its cheapness. In this case the material had been obtained from the local store. I sent a sample of both the pigment and tank water, taken from the sole domestic supply, for examination, and append extracts from the report obtained.

"Forty cubic centimetres of the water gave a stain equivalent of 0·0002 gramme per litre ($^1/_{80}$ grain per gallon). 0·2 gramme of the pigment gave in half a minute a stain of great intensity and as the normal test period is thirty minutes, the inference is that the pigment contains relatively a very large amount of arsenic. Since the roof is coated with a paint prepared from this pigment, it constitutes a danger of grave magnitude."

The sample of water was taken, unfortunately, just after a long spell of dry weather had ended and the percentage of arsenic present was therefore considerably less than it had been for some months previously.

The receipt of this report also revealed to me the cause of periodical attacks of abdominal pain, vomiting and diarrhœa in three children in another home, the roof of which had been similarly painted. Removal of the cause resulted in "cures" in the children and pronounced improvement in the woman.

I report these cases as "pyrites" paint is apparently much used in some districts, especially where a cheap form of paint is required.

## TRAUMATIC EPILEPSY.

By ARTHUR MURPHY, M.B., Ch.M. (Sydney), F.C.S.A.,
*Honorary Ear, Nose and Throat Surgeon, Hospital for Sick Children, Brisbane.*

MR. G.R.E., aged thirty years, when eleven years old, was shot at short range by a Winchester 22-short pellet fired from in front. It entered and destroyed the right eye and did not emerge. No X ray examination was made. Except for the loss of an eye he experienced no disability till he was about sixteen years old, when epilepsy of non-Jacksonian type appeared and increased in frequency and severity up to the time I first saw him in 1922. After accurate localization by X rays I set out to remove the bullet from the inferior part of the right temporal lobe on the superior surface of the petrous bone, just external to and above the internal auditory meatus.

The usual procedure for opening the cranium was followed and I had the valuable assistance of Dr. F. C. Wooster, of Rockhampton. The bullet was found and grasped first with one form of Heath's aural forceps, but it could not be dislodged. Eventually a medium weight pelvic clamp was fixed on it, but this also failed to dislodge it from what seemed to be firm fixation to the tentorium. As it lay in the immediate vicinity of the superior petrosal sinus and perhaps by one extremity had penetrated the tenetorium, I feared that the medulla might be affected by hæmorrhage or œdema if further force were used for extraction. It was left *in situ* and I freed the under surface of the temporal lobe from numerous soft adhesions along the path of entry and closed the scalp wound. The result of this procedure was complete freedom from the attacks for about six years, when they began to recur.

This time they assumed a somewhat different form. In the first place they were always preceded for a varying period by a feeling of tingling in the left little finger; further, the patient believed that inclination of the head to the right precipitated an attack. Although this posture did not invariably result in one he had come to fear it and as far as possible to avoid it. When I saw him this time he was having about four daily attacks in his waking hours. He did not believe that his sleep was disturbed by them to anything like the extent prevalent before operation, but this was not altogether substantiated in hospital prior to his second operation. Now, however, the attacks were much less severe than prior to the operation. This time he asked for the removal of the bullet, no matter what the risk was.

With the able assistance of Dr. E. S. Meyers, of Brisbane, I reopened the cranial cavity through the old opening which I had to enlarge somewhat, and on lifting the brain from the tentorium was immediately faced with what proved to be a flaccid-walled fibrous cyst the size of a walnut through which apparently the bullet could be felt. With forceps it was easily grasped with the outer cyst wall included and on incising this latter a very small quantity of pale, straw-coloured, clear fluid escaped. Inside the bullet was lying free, except for its nose which again seemed firmly held in a fibrous mass consisting of tentorium and cyst wall. This time, with a narrow-bladed scalpel I dissected it out and excised the part of the cyst

wall on the surface. On closing the scalp wound I laid immediately on the dura a pedicled flap of adipose tissue turned up from the neck. He recovered without mishap, even avoiding headache, and up till now, just over one and a half years later, has remained entirely free from epilepsy or any cranial discomfort.

# Reviews.

## THE LARYNX.

IN his introduction to "The Mechanism of the Larynx," by V. E. Negus, Sir Arthur Keith describes how he found the author studying in one of the work rooms of the Museum of the Royal College of Surgeons, how the latter stayed on year after year, adding more specimens to his collection, until he had scarcely room to move. From his "vague, hesitating and self-depreciating answers," Sir Arthur Keith was "stupid enough to take this young man . . . at his own valuation." He soon corrected his error of judgement and he presents Negus as having not only something of Darwin's detached attitude of mind, but also the great naturalist's untiring questioning of Nature, the same impartiality in setting down his observations, and the same modesty when he comes to draw his conclusions. Negus's methods "are those of John Hunter"; for him the question which has to be answered is never "what is a structure like"? but "what is a structure for"? According to Sir Arthur Keith, Negus "has laid a new foundation for all that we know concerning the larynx and of the varied rôles which that organ plays in the vital functions of the living body." There could surely be no stronger recommendation than this; and we must state at once that there is nothing to approach this book in the English language, nor, as far as we can discover, in any language. The amount of work represented in its pages is colossal. It will be indispensable to physiologists, comparative anatomists and to all medical practitioners who have to do with the larynx and its disorders. It must be regarded as the standard work for many years to come.

Negus, throughout the work, has considered his subject from the developmental point of view. In the first chapter he deals with the evolution of the larynx from its first appearance in fish up to the stage of its more elaborate structure in cats; the function is that of preventing the entrance into the pulmonary air tract of any substances except air. In the chapter on modifications for olfaction Negus shows that nasal respiration is adopted primarily for olfactory reasons; coaptation of the larynx and naso-pharynx has for its primitive object the maintenance of the olfactory sense while the mouth is open and this mechanism is made perfect by means of the epiglottis. The epiglottis, in association with the naso-pharynx and soft palate, is primarily evolved for purposes of olfaction. In the chapter on modifications for respiration will be found a discussion of the factors that have given man an air tract incapable of carrying a large supply of oxygen to his lungs and of carrying a corresponding large volume of carbon dioxide from them; in this man differs from the fast-running quadrupeds. There follow chapters on modifications for specialized mechanism of respiration, on the function of movements at the glottis during respiration, on modifications for deglutition, on modifications for regulation of intrathoracic pressure, on the purposive use of sound in relation to the sense of hearing, on the employment of sound as a means of communication, on the mechanism of phonation.

The author makes some interesting observations on singing. He does not attempt an exposition on the art of singing. He shows that success in singing depends on the coordinated action of over a hundred muscles and states that it is doubtful whether a satisfactory result would be obtained if students of singing were taught the technical terms and instructed in the anatomy and physiology of the vocal mechanism. This may be true and probably it is, as he states, better to rely on such vague terms as "thinking the voice forward" and "feeling the voice on the lips." The point is that many would-be teachers of singing display an appalling ignorance of even the mechanism of respiration and are unable to instruct their pupils. But perhaps this subject is not of great interest to medical practitioners. Negus includes an extensive bibliography in his book and the index, compiled by his wife, is excellent.

[1] "The Mechanism of the Larynx," by V. E. Negus, M.S. (London), F.R.C.S. (England); with an introduction by Sir Arthur Keith, F.R.S.; 1929. London: William Heinemann (Medical Books) Limited. Crown 4to., pp. 560, with illustrations. Price: 45s. net.

## PSYCHOLOGY.

DR. ERWIN WEXBERG, of Vienna, must be congratulated for writing "Individual Psychology", a masterly work on the Adlerian viewpoint.[1] He has been fortunate in his choice of translator, Dr. W. Beran Wolfe.

The book, whilst not entirely free from partizanship, is characterized by a depth of vision which augurs at a not far distant date the passing of the numerous schools of psychology and the birth of one which will embody the truths of all.

The author bases his thesis on the phenomenon of child life, and, following Adler, considers a feeling of inferiority the fundamental component. This is based on three groups of experience—the feeling of helplessness, the feeling of being weaker than adults and the feeling of dependency upon adults.

A chapter on organ inferiority makes interesting reading. Much of Beethoven's greatness is regarded as due to over compensation for his otosclerosis. The beautiful handwriting of certain individuals is analysed as an indication of original left handedness. The significance of organ inferiority is summed up as due to: (i) The actual defect in the available material; (ii) the point for crystallization for compensation and over compensation; (iii) the deepening of the feeling of inferiority possessed by every child and its effect on the striving for significance.

Paradoxically, physical beauty is often to be regarded as an organ inferiority—beautiful children, admired and petted through childhood, grow up in the illusion that all they need to do in life is to look pretty. The handicaps of too rich and too poor children are similarly analysed.

Dr. Wexberg places tremendous importance on the influence of environment and stresses the family constellation as a factor in personality development. Only children are noted as constituting a large percentage of psychopathic patients—truly an indictment on the wisdom of birth control.

Sex and character form the heading for a chapter which deals *inter alia* with the position of woman in society. That the sex has achieved little is regarded as being due to an popular pessimistic view of their destiny; they share in the prejudice and they dare little and their achievement is commensurate.

Four chapters are devoted to the structure and form of the neuroses and psychoses, mental disease and criminality. The neurotic is regarded as a discouraged human being whose ambition has suffered shipwreck, resulting in fear of making decisions, flight from reality, substituting side shows for the main activities of life.

Dr. Wexberg's views on the education of children in themselves make the purchase of the book worth while. The rules for guidance are extremely practical and he wields a spirited pen on the most misused word in the vocabulary —love. Just why parental love falls under such a severe criticism is left as a further bait for the prospective purchaser. It may be added that whilst the book will be of chief interest to those who have psychological training, it can be read with utility by the intelligent layman.

[1] "Individual Psychology," by Erwin Wexberg, M.D.; 1930. London: George Allen and Unwin Limited. Demy 8vo., pp. 448. Price 15s. net.

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## WORKERS' COMPENSATION IN WESTERN AUSTRALIA.

COMPENSATION to workers in Western Australia for injuries suffered in the course of their employment is governed by the *Workers' Compensation Act*, 1912-1924, as finally amended in 1927. The amount of money payable to the injured worker and to the medical attendant under the provisions of the first schedule of the act should be satisfactory to both. When death results from the injury the dependants may receive a sum of money up to six hundred pounds. If the injured worker leaves no dependants, "the reasonable expenses of his medical attendance and burial, not exceeding one hundred pounds" are payable. When total or partial incapacity for work results from an injury, the amount payable to the worker depends on his average weekly wage during the previous twelve months and on the number of his children under the age of sixteen years. Payments in the aggregate may reach a total of seven hundred and fifty pounds. In addition there is payable a sum equal to the "reasonable expenses" incurred in respect of medicines, medical or surgical requisites and medical or surgical attendance, but not exceeding a total of one hundred pounds. This sum includes hospital charges and fees of specialists.

In 1927, after the act had been in operation for a short time, complaints were made in regard to some of the accounts for medical attendance. After discussion it was suggested that a committee should be appointed for the purpose of reviewing disputed accounts. The suggestion was adopted and three members of the Underwriters' Association of Western Australia were appointed to act with three members of the Western Australian Branch of the British Medical Association. This committee has been acting ever since. It should be pointed out that this committee is a voluntary one and that it has no legal status. Its decisions, however, are accepted by the members of the Branch and it has done most useful work. Of course, the accounts submitted to this committee have included those of practitioners who do not belong to the Branch. As an example of the work of the committee the following figures may be quoted. During the period April 6, 1927, to December 31, 1929, the underwriters and the Government Actuary sent to the Committee only those accounts that were in dispute. The number of accounts was 195 and the amount of these accounts, £2,525 4s. 7d., was reduced by £334 11s. 6d. During the period January 1 to March 31, 1930, the underwriters sent all accounts to the Committee. The accounts numbered 426 and totalled £2,524. Thirty-one were reduced by amounts totalling £137 8s. and eight were increased by a total sum of £19 1s. 6d. From these figures it is obvious that in the past by far the greater number of accounts from medical practitioners have been accepted by insurance companies without question.

During recent years the amount of money expended in compensation for injury received in the course of employment has increased considerably in Western Australia and the same statement probably holds good in regard to other States. One of the leading weekly newspapers of the Commonwealth recently contained an article in which reference was made to workers' compensation in Western Australia. It was pointed out that in 1923 the cost to industry of workers' compensation was £71,213 and that this sum increased each year until in 1929 the sum involved was £297,851. While we do not wish to question the correctness of these figures, it is not unlikely that part of the increase since 1923 may

be due to the fact that the present act is not identical with the act that was in force in 1923. The present act is really the result of amendments made to the 1912 act in 1920, 1923, 1924, 1925 and 1927. In the newspaper article referred to, it was stated that the act has led to malingering and self-inflicted minor injuries. This is known to be a fact, but it is extremely difficult to prove either malingering or self-infliction of injury in any particular instance. It was also stated that the liberal terms of the act have "conduced to collusion between claimants for compensation and not too scrupulous members of the medical profession." This is an iniquitous statement and one which the writer should be prepared to substantiate. If information of this nature were available it should be submitted to the legal authorities of the State so that public prosecution could be undertaken. Not only would conspiracy of this nature be an offence against the law, it would also be infamous conduct in a professional respect and should be punished by deregistration. We do not believe the statement to be true. The increased cost of workers' compensation in Western Australia (and possibly in other States) is in part due to the way in which certain medical practitioners treat their patients. Some of these practitioners are known to the reviewing committee, for the accounts that come up for review are nearly always from one of the same small group. The maximum fee under the schedule of fees is not the fee that should be charged in every instance, nor is it necessary to pay daily visits to a patient with a trivial ailment. No one could argue with conviction that it is necessary to carry out daily dressings, for example, of an injured finger on every day of the week except Sunday. And yet this is sometimes done. Although major injuries, with their attendant large fees, are sometimes quoted in discussions on the cost of compensation, it is in the smaller injuries that incorrect charges are made. Medical practitioners in Western Australia and in every other State of the Commonwealth must treat an injured worker in the same way as they would treat him were he a working man being treated as a private patient who was expected to pay his own fees. It is admitted that many anomalies exist which are crying aloud for correction, but there is no doubt that under the compensation acts in the several States fees are being paid for many patients who previously were treated free of charge either by private practitioners or at out-patient departments. There is such a thing as killing the goose that lays the golden egg. It is common knowledge that in Western Australia an attempt will shortly be made to amend the act, and that the Western Australian Branch of the British Medical Association will be asked to reconsider the schedule of fees. It will be useless to point out that some of the offenders are not members of the Association. If they are wise, the members of the Branch will advocate the creation of a permanent commission with a permanent medical officer attached as advisor. If this were done, it would probably not be necessary to reduce either the amounts received by patients or the fees paid to medical practitioners. A commission, being a statutory body, could wield a power impossible to a voluntary committee. It could do a great deal to suppress malingering, to discover self-infliction of wounds and to suppress the therapeutic exuberance of certain medical practitioners.

## Current Comment.

### THE ÆTIOLOGY OF THE COMMON COLD.

Up to the present investigations into the ætiology of the common cold have been handicapped by the lack of any susceptible laboratory animal. Attempts to transmit the condition experimentally have therefore had to be made with human volunteers. In dealing with so ubiquitous an infection, very strictly controlled experiments are necessary if results are to be significant and it is obvious that only under very exceptional circumstances can human subjects be submitted to scientifically adequate control. The results of various workers are very inconsistent and three distinct views of the ætiology of the common cold have been put forward.

The most widely held opinion has probably been that the condition is a manifestation of infection by a filter-passing agent. Positive experiments in which volunteers have contracted colds after the instillation of filtered nasal washings were first recorded by Kruse in 1914. Since then others have reported experiments along the same lines with very variable results. On the whole more failures than successes have been encountered. The discovery of the filter-passing anaerobic bacteria of the respiratory tract by Olitsky and Gates in 1921 directed attention to the possibility of some member of this group being responsible for the common cold. And finally there

have been adherents of the view that the infection is due to the increased virulence of one or other component of the normal bacterial flora of the naso-pharynx.

In a series of investigations extending over several years Dochez, Shibley and Mills have studied intensively these three alternatives and in their most recent communication[1] they describe experiments which leave little doubt that the infective agent is a true filter-passing virus. In their search for a suitable laboratory animal for transmission experiments they found that it was well recognized by keepers of anthropoid apes that these animals were frequently infected by contact with human patients and that their "colds" resembled the human affection in all essentials. Young chimpanzees, two to four years old, were therefore used in their experiments. Their susceptibility to contact infection was readily confirmed and very strict quarantine precautions had to be observed in the experiments. After a few days' observation to insure the absence of any respiratory infection, the apes were given intranasally Berkefeld filtrates of broth washings from early cases of coryza. In 44% of the experiments a typical cold was induced twenty-four to forty-eight hours after the instillation of the filtrate. The animals showed loss of appetite and lassitude for a day or two. There was a moderate to profuse watery nasal discharge which became muco-purulent on the second or third day, and frequently a mild inflammation of the throat. Recovery was usually complete from seven to ten days after the onset. As in man, no lasting immunity followed the "cold," but attempts at experimental reinfection of the chimpanzees within three or four months usually failed.

A large number of control experiments in which naso-pharyngeal washings from normal persons were instilled, gave no positive results. All the filtrates used in transmission and control experiments were studied according to the technique of Olitsky and Gates for the presence of filter-passing anaerobes. These organisms were frequently present in both infective and non-infective filtrates, but the isolated strains formed culturally and serologically a very heterogeneous group. Further, a number of transmission experiments were positive in which the filtrates contained no culturable microorganisms. Dochez and his coworkers therefore hold that one can exclude the possibility that the infectivity of the filtrates is due to the presence of organisms of the *Bacillus pneumosintes* type, and are convinced that the active agent is a true ultramicroscopic virus.

In a subsequent series of experiments human volunteers were used under similar conditions of strict aseptic quarantine. Of nine subjects who received filtrates of material from early cases, four showed a typical cold commencing the following day.

An incidental observation suggests that the anthropoid apes may prove very useful in the study of other human respiratory infections, particularly of the influenzal type. Shortly after recovering from an experimental cold one chimpanzee developed an acute respiratory infection of a different type, apparently by contact with an attendant suffering from mild "influenza." If this occurrence was not purely accidental, it holds out a promise that a few well organized experimental studies on the chimpanzee may result in a definite answer to the most outstanding problem in medical bacteriology—the ætiology of epidemic influenza.

[1] *The Journal of Experimental Medicine*, Volume LII, 1930.

## BRONCHOSCOPY IN POST-OPERATIVE PNEUMONIA.

IN another place in this issue will be found a short abstract of a paper read by Chevalier Jackson at a meeting of the Royal Society of Medicine.[1] Jackson, as is well known, is the great exponent of the use of the bronchoscope and any communication by him on the subject is certain to command attention. It is, therefore, interesting to note his remarks on post-operative pneumonia. He states that in his experience true lobar pneumonia is an exceedingly rare complication of any surgical procedure. He finds that bronchoscopy done in the presence of a condition regarded from clinical findings as pneumonia, has nearly always shown the condition to be one of obstructive atelectasis. This is important in view of the work of Coryllos and Birnbaum, who regard pneumonia as the pneumococcal variety of obstructive atelectasis. This was discussed in these pages on May 11, 1929. Coryllos and Birnbaum went so far as to attempt aspiration by bronchoscopy in the treatment of patients with pneumonia. Jackson uses bronchoscopic aspiration in the treatment of patients with post-operative pneumonia. He points out that when the obstruction is not removed, the defensive powers of the lung that are dependent on ventilation and drainage, are annihilated, the few organisms present in the bronchi multiply, drowned lung succeeds the atelectasis and pulmonary abscess follows. Of 224 patients with pulmonary abscess following operations on the tonsil and upper air passages who were treated by bronchoscopic aspiration, 136, or 61%, were apparently well and free from symptoms "when last seen"; 32, or 13%, were unquestionably improved; 24, or 11%, were worse or unimproved and 24 were referred to the surgeon. There were eight deaths, none of which was attributed to bronchoscopic treatment. Jackson points out that bronchoscopy has revolutionized the prognosis of suppuration and has reduced the mortality from about 75% to 2% or 3%. He refers to improvement in the prognosis of suppurative disease not due to foreign bodies, but gives no figures. On a previous occasion we questioned the wisdom of using bronchoscopy in lobar pneumonia. In post-operative pneumonia, which is an obstructive atelectasis, the matter is different. Undoubtedly bronchoscopy will be used more in the future; it will, however, be an adjuvant and will not displace other treatment.

[1] *Proceedings of the Royal Society of Medicine*, November, 1930.

# Abstracts from Current Medical Literature.

## OPHTHALMOLOGY.

### Iridencleisis and Iridectomy for Glaucoma.

S. HOLTH (*Archives of Ophthalmology*, December, 1930) appears to have given up his punch operation and trephining for glaucoma and now uses iridencleisis with iridectomy. He considers that this operation effects the most lasting drainage and is free from the late infection. A subconjunctival tunnel is made with a stop keratone simultaneously with the limbal incision into the anterior chamber. The iris grasped at the pupillary edge is drawn just outside the limbal incision. "Through the extralimbal part of the pupil the surgeon inserts the one blunt blade of de Wecker's iris scissors underneath the back of the iridial tent, while the other blade rests on the front of the tent . . . He now releases the iris from the forceps (the iridial tent lies between the two blades of the scissors) and removes the iris forceps from the field of operation. The meridional clip through the iridial tent is now made." The conjunctival wound is closed by a fine silk thread which is removed on the third day. The open wound treatment is used, although under a perforated aluminium shield. A binocular bandage is superfluous, as the cut through the sphincter pupillæ hinders the retraction of the two sphincter angles to their original position.

### Rectal Narcosis in Ophthalmic Surgery.

O. G. MORGAN AND J. M. LEES (*The British Journal of Ophthalmology*, November, 1930) found that rectal narcosis with "Avertin" almost wholly fulfils all the requirements. "Avertin" is tribromethyl alcohol. It must not be heated above 40° C. (104° F.), at which temperature it decomposes and if injected causes colitis. The dosage is between 0·06 and 0·09 gramme per kilogram, according to the effect required. With the smaller dose coordinate movements are retained and may be elicited on command. The larger dose was successfully used in extirpation of lachrymal sacs, plastic operations and enucleation. On two occasions small quantities of chloroform and ether were used in addition. The bowel is washed out early in the morning. An hour before the operation 16 milligrammes (a quarter of a grain) of morphine with 0·65 milligramme (one one-hundredth of a grain) of atropine are given. Half an hour before operation the "Avertin" is given by rectal tube, five to ten minutes being taken for the process. Sleep usually follows in ten minutes and the requisite degree of narcosis in twenty-five to thirty minutes. Over fifty patients have been treated in this manner, including those subjected to cataract extraction and operation for acute glaucoma. The ages of patients ranged from sixteen to eighty-seven years. The patient sleeps for several hours after operation and awakes with complete amnesia of the event.

### Unilateral Exophthalmos.

J. WOLFF (*American Journal of Ophthalmology*, November, 1930) describes a sign in differential diagnosis of the lesions present in unilateral exophthalmos. A stethoscope is placed over the closed lids of the normal eye, the opposite nares being closed and the breath sounds and voice carefully noted. These are then compared with the sounds heard over the proptosed eye. The author found that nasal respiratory sound and vocal fremitus are intensified over the protruding eye when the lesion is solid (that is, osteosarcoma, endothelioma) and diminished when the lesion is soft or contains fluid (that is, cysts, vascular tumours).

### The Denig Transplant in Trachoma.

B. FRIEDMAN (*Archives of Ophthalmology*, December, 1930) removed sections from a Denig graft in two patients, partly to improve the cosmetic results and to examine the sections. The Denig graft was designed by its author to check the formation of pannus. He transplanted at the upper limbus a section of the mucous membrane of the mouth and maintained that the mucosa of the mouth was proof against the invasion of trachoma. It also improved the nutrition of the cornea and protected it to some extent from the rubbing of the lids. As the result of a study of the graft sections, the author concludes that the mucous membrane of the mouth as a perilimbal graft is not immune to the invasion of trachoma; that the vascularity of the pannus is apparently not altered by the removal of the limbal conjunctiva or the substitution of the graft. The author is inquiring into the soundness of the theoretical principles rather than passing judgement on the clinical efficacy of the Denig graft.

### Argyrosis Corneæ.

B. FRIEDMAN AND A. RÖTTH (*American Journal of Ophthalmology*, December, 1930) report that among twelve cases of conjunctival argyrosis a corneal argyrosis was seen with the slit-lamp. The pigment layer lies at the posterior surface of the optical section, probably between Descemet's membrane and the endothelium. In some cases there is argyrosis of the lens. There is a similarity in argyrosis corneæ to Kayser-Fleischer corneal ring.

### Kayser-Fleischer Corneal Ring.

D. L. POE (*American Journal of Ophthalmology*, December, 1930) relates the case of a patient of nineteen years admitted for progressive rigidity suggesting a lesion of the cerebral basal ganglia. The condition was similar to that described by Wilson as "progressive lenticular degeneration," a familial nervous disease associated with cirrhosis of the liver. Examination of the eye revealed a circular brownish-green pigmentation which extended around the cornea at the limbus; it resembled the Kayser-Fleischer ring of the Westphal-Strumpell pseudosclerosis or Wilson's hepatolenticular degeneration. With the slit-lamp the pigmentation was found to be located in Descemet's membrane. The gonioscope showed that the sclera, iris and other structures are free from pigment. Other examiners have described a delicate bluish-grey opacity in the anterior part of the lens, seen only with reflected light; it resembled a Purtscher pseudocataract. The Kayser-Fleischer ring is regarded by many authorities as a pathognomonic sign in hepatolenticular degeneration.

## OTO-RHINO-LARYNGOLOGY.

### Suppurative Diseases of the Lung.

CHEVALIER JACKSON (*Proceedings of the Royal Society of Medicine*, November, 1930) in an occasional lecture discusses suppurative diseases of the lung and the aid of bronchoscopy to the physician. Ætiology, prognosis and bronchoscopic treatment are dealt with and the histories of a number of patients are given. Bronchoscopic aspiration is indicated for treatment: to prevent stagnation; to restore the defensive powers of the lung, especially the ciliary action; and to remove obstruction if present, and to prevent acute suppurative processes from becoming chronic. Greatly increased efficiency in vaccino-therapy can be obtained by the use of vaccines prepared from residual pus obtained directly from the suppurative focus in the lung after the superjacent stagnant pus has been aspirated off. Such specimens are uncontaminated by secretions from the mouth. Bronchoscopic aspiration, if used promptly, is successful in the restoration of function in post-operative atelectasis. In this condition the obstruction causing the collapse is in the form of secretions. The bronchoscopic aspiration of these secretions results in very prompt reexpansion of the lung. The author refers to the curious national differences in statistics as to pulmonary abscess complicating operations on the tonsils. In some countries the operators have not seen a single case, whereas in the United States of America there have been a great many cases. Considering the frequency with which the tonsil is probably the primary infective focus in pulmonary suppuration in patients who have not had a tonsillectomy, it is possible that some of the post-tonsillectomy patients would have had pulmonary suppuration sooner or later, even if no operation had been done. Bronchoscopy has revolutionized the prognosis of suppuration due to foreign body. In the pre-bronchoscopic days the mortality was about 75%.

Under modern bronchoscopic methods the mortality is probably not more than 2% or 3%. The prognosis of suppurative disease of the lungs and bronchi of other than foreign body origin has been greatly improved by the addition of peroral bronchoscopic drainage to medical care and management.

### Milk-Borne Sore Throat.

EDWARD A. LANE AND GAYLORD W. ANDERSON (*The New England Journal of Medicine*, August 14, 1930) describe an explosive outbreak of sore throat affecting 178 patients in a small community with a population of less than 3,000. The causative organism was not identified, but it was shown to be a hæmolytic streptococcus with characteristics not typical of the epidemicus variety. The vehicle of infection was raw milk. This was suggested by the nature of the illness and corroborated by finding that 92% of the patients used the same milk supply. The source of infection was very evidently one or more of the workers on the dairy farm, who either directly infected the milk through hand capping or milking, or transmitted to one of the cows a transient udder infection which had cleared up before the commencement of the investigation. Hæmolytic streptococci were obtained from the throats of two of the milk handlers and from patients. Hæmolytic streptococci were cultured from the throat of one milk handler daily for several days, but from the throat of the other milk handler growths of the organism were obtained daily for several weeks. At the end of this period tonsillar remnants were removed, with the result that the bacteria promptly disappeared.

### Agranulocytosis.

NATHAN ROSENTHAL (*The Laryngoscope*, August, 1930) emphasizes the importance of watching the changes in the blood picture associated with various kinds of ulceration of the buccopharyngeal mucous membrane. The symptom complex to which the name agranulocytic angina has been applied by Friedemann is described as being characterized by manifestations of necrosis in the mouth and throat and profound diminution in the number of white blood cells, mainly affecting the polymorphonuclear cells. This condition was first described in 1922 by Schultz who chose the name agranulocytosis by way of indicating that ulcerative lesions in the mouth and throat may be absent. Fifteen patients suffering from agranulocytosis were observed by the author. Of these he reports a mortality of 60%. There is no specific treatment.

### The Surgical Treatment of Otosclerosis.

MAURICE SOURDILLE (*The Journal of Laryngology and Otology*, September, 1930) in a paper dealing with the surgical treatment of otosclerosis, describes his operative technique and the results obtained in six completed operations. He performs a two-stage operation. The object of the first stage of the operation is not to modify the hearing, but to explore the middle ear and to isolate it by doing an atico-tympanotomy. The simple operation may be employed or it may be combined with an internal plastic operation in which a tympanic hinge is used. The flap is obtained from the posterior superior wall of the membranous canal and is lowered inwardly against the internal wall of the attic. By its adherence to this wall the tympanic cavity is hermetically closed and separated from the mastoid region. The second stage of the operation which is done a few months later, when the cicatricial lining of the mastoid cavity is sufficiently thin and transparent, has for its object the aseptic opening of the *canalis semicircularis externus* and the occlusion of this fenestration by a thin epidermic membrane. The success of the operation depends on the epidermic flap which must cover the trepanation opening. If the flap remains thin, closely applied to the osseous plane and the orifice of the trepanation of the semicircular canal, the "hearing lasts without any change." Both stages of the operation are done under local anæsthesia combined with the local administration of abundance of adrenalin solution. The recovery of hearing appears to depend on: (i) The degree of deafness before operation; (ii) the decompression of the perilymph; (iii) the size of the artificial orifice; (iv) direct access to the labyrinth by waves of sound by means of this orifice. The membrane should be epidermal on the outside in order that it may be able to stand exposure to the air and its impurities, and epithelial on the inside, where it is in contact with the perilymph. It should be thin and should adhere closely to the orifice of the artificial fenestrum, so as to transmit the vibrations of the air to the perilymph in their entirety. Various stages of the operation are illustrated.

### Complications of Tonsillectomy.

WILLIAM HARTZ (*The Laryngoscope*, August, 1930) in a paper dealing with the complications of tonsillectomy gives Morowitz's classification of the causes of hæmorrhage, which include: Anomalous blood supply, traumatism to the pillars, menstruation and pregnancy, arteriosclerosis, acute tonsillitis, fibrous tonsils, acute infectious diseases, active syphilis, hæmophilia and sloughing of vessel walls from low grade infection. Most blood is lost by young, healthy males between eighteen and thirty-five years of age. Least bleeding occurs in slender women between the ages of thirty and sixty years. Most bleeding is from the muscles in the upper part of the tonsillar fossa. *Status lymphaticus* may be diagnosed by large tonsils and adenoids, large cervical glands and a waxy pallor. Such patients should be especially watched, as they do not take ether well and may die as late as thirty-six hours after operation. Retropharyngeal abscess may develop in patients who have had frequent attacks of quinsy previously. Tuberculosis should be guarded against and a careful physical examination should be made in every instance. Operations should not be performed as a rule when there is evidence of active or arrested disease, and especially if there is laryngeal involvement. Lymphatic nodules may form years later, due to new growth of granular or true tonsillar tissue giving the appearance of incomplete removal of the tonsil. The Eskimos of Labrador are the only people without large tonsils. Their food is salt fish and blubber. The tonsils are only lymph spaces between the pillars. The author concludes that tonsillectomy should be considered a major operation. A complete history should be taken and a thorough physical examination made. Plenty of time should be given for rhinitis, tonsillitis, oral abscesses and quinsy to clear up before operation. If possible, operations should be postponed when epidemics prevail. Coagulation time should be taken, although tests differ in the laboratory from actual results at operation. In the lymphatic type an X ray photograph should be taken of the chest for the purpose of disclosing the presence of possible pathological conditions of the thymus.

### The Spheno-Palatine Ganglion.

D. STEWART AND VICTOR LAMBERT (*The Journal of Laryngology and Otology*, November, 1930) discuss the study of the spheno-palatine ganglion and give an historical review of the subject dating from the first paper of Sluder in 1908. The anatomical relations and connexions of the spheno-palatine ganglion are given and Sluder's syndrome is discussed. A list of diseases and symptoms which have benefited by thorough treatment of the spheno-palatine ganglion is also given. The authors conclude that there exists a neuralgic type of pain of widespread distribution about the head and neck which differs from the true *tic douloureux*, that its cause is probably due to nasal infection, but that its underlying neurological nature is still obscure. The control of the so-called sympathetic syndrome can be understood, though the mechanism may not be as described by Sluder. The trophic influence which the spheno-palatine ganglion is said to exert over the nasal mucosa (for example, in ozœna) is not in keeping with experimental evidence. Any phenomena obtained as a result of treatment to the region of the spheno-palatine cannot be separated from phenomena resulting from involvement of the nerves of the spheno-maxillary region as a whole. The anatomical explanation offered by the supporters of the ganglion theory is not founded on the conception of the anatomy of the region as understood by pure anatomists.

# Special Articles on Diagnosis.

*(Contributed by Request.)*

## XXXVI.

## LEPROSY.

SINCE the development of the treatment of leprosy to a stage which provides great hope for early sufferers, early diagnosis has become so important that too great stress cannot be placed upon it. Accordingly old standards upon which decisions were made as to whether a patient suffered from leprosy or not, have become quite inadequate. The finding of bacilli is no longer held to be essential for the certainty of the diagnosis. Nowadays the existence of plentiful bacilli widespread through the body, in skin lesions and in nasal secretion, generally means at least a fairly well established and often a not very well resisted infection.

Apart from the difficulties of garnering enough evidence from the patient's history and body to justify a diagnosis of leprosy, especially in the early stages, two important obstacles exist. The first is that most medical men, unless working in a country where leprosy is common, fail to suspect the possibility of the disease and therefore fail to elicit the evidence that a lesion is anæsthetic. The second is that many practitioners trained and working in a country where leprosy is rare, are far from familiar with the appearances produced even by advanced disease of this nature. Klingmüller[1] is insistent upon this point, though it is hard to see how the matter can be remedied in such countries. Muir[2] [3] continually stresses the urgent necessity for early diagnosis and has done wonders for the education of medical practitioners and laymen in India. Jadassohn[4] sounds the same note as the others.

Tebbutt[5] and the writer[6] published descriptions of a series of cases in 1926 to show, among other things, that in early cases of leprosy the usually accepted doctrine of the ease in finding bacilli and the accepted histopathological structure of leprous lesions did not by any means hold good. To such a degree did the cellular structure of our specimens depart from the accepted form that no mention of such forms could be found in Anglo-Saxon literature. The presence of giant cells was mentioned as a possibility in one book only and was flatly denied in some. The only source from which we could obtain full and accurate accounts of the structure and peculiarities of specimens similar to ours and thereby solve our difficulties was Jadassohn's[4] contribution to the 1913 edition of Kolle and Wassermann's handbook.

The situation is very different today and scarcity or apparent absence of bacilli is not now held as valid evidence against a diagnosis of leprosy, especially in an early stage, and the existence of tuberculoid forms of the disease is well established in spite of Muir's objection to the term.[1] [4] [10]

### Classification of the Manifestations of Leprosy.

In order to understand the stages of leprosy in a manner required for the application of methods of diagnosis to be described, it is necessary to form a classification of the manifestations and stages of the disease, rather more elaborate than that found in most text books.

#### *Clinical Classification.*

Muir[2] [3] has devised a classification based upon the relative abundance of bacilli in the different forms and stages of leprosy. These are divided into A1, A2, B1, B2 and B3 groups. Though, no doubt, admirable for use in official returns and reports from widespread clinics to a central body such as Muir directs, and suitable in the hands of leprologists employed in such an organization as that of the British Empire Leprosy Campaign in India, such a classification is obviously useless for the purpose of teaching students and practitioners in a country where leprosy is rare. For such purpose some classification which is based upon description and not burdened with symbols is essential. Therefore the old classification into the following types will be adhered to: (i) Nodular (relatively acute) form; (ii) mixed (subacute) form; (iii) maculo-anæsthetic (chronic) form. But we must add: (iv) the tuberculoid form (also chronic, though not necessarily permanently so).

Tuberculoid forms apparently generally develop into the maculo-anæsthetic type, occasionally under unfavourable circumstances into the mixed type, but only rarely into the acute nodular form. According to recent experience in Australia this is the common form found in primary or early lesions in white patients. The last four early cases (during the course of six years) that have come under the writer's notice have all been of this type. We used to miss them without doubt in the past and only discovered them as lepers when the cases were advanced. They are called tuberculoid in order to sound a warning that early leprous lesions can imitate tuberculosis, both in naked eye and in microscopic appearances to an extent that a distinction can be made in some instances only by the presence of anæsthesia and by failure to cause tuberculosis when portions of tissue are inoculated into guinea-pigs.

#### *Pathological Classification.*

In parallel with the above clinical grouping a classification on pathological lines is also necessary.

1. In the acute nodular lesions there are numerous lepra cells, apparently of endothelial origin, large and swollen connective tissue cells and lymphoid cells. There are some multinucleated cells, but not of the Langhans type. The lepra cells contain numerous bacilli which also occur outside the bodies of the cells, that are often separated by amorphous material called "glœa." In the very acute forms extracellular bacilli are more common; they are released, probably, by disintegration of lepra cells. Only in acute or in breaking down lesions is the epithelium seriously involved.

2. Nodules of mixed leprosy have a similar formation to the above, but the cell structure is less blurred, bacilli are still plentiful, but not in the profusion found in the acute nodular lesions.

3. In the maculo-anæsthetic type there is granulomatous infiltration between the nerve bundles. Giant cells have been noted between the nerve bundles, first, as far as I have been able to discover after a long search of the literature, by Tidswell[9] in 1895 and again by Tebbutt[5] in 1926. Granulation gradually changes to fibrous tissue. Bacilli are sparse or rare, but the nerve trunks may be the only situation in which they can be found at all.

4. There are two subgroups of lesions found in the tuberculoid form. The first has typical Langhans giant cells with epithelioid cells and lymphoid cells, sometimes grouped in typical "follicular" fashion.[6] The second subgroup has few or no giant cells, but the epithelioid cells are closely packed and there are some lymphoid cells. In both cases the infiltration tends to be grouped around vessels, sweat glands, hair follicles and nerve fibrils. The first subgroup may be mistaken for and may be indistinguishable from *lupus vulgaris* by microscopic examination. The second is histologically indistinguishable from the tuberculous lesions of *lupus pernio* and Boeck's sarcoid. In both varieties bacilli are exceedingly rare and discovery of them demands patient search of serial sections. (Even this failed in one of our cases and bacilli were ultimately found in a cutaneous nerve leading from an anæsthetic area.)

Of course, it is hardly necessary to point out that, whatever classification is used, the different groups merge into one another. No patient suffering from nodular leprosy has freedom from nerve involvement, mixed types are common and very few sufferers from disease of the maculo-anæsthetic type are free from skin lesions throughout the entire course of the disease.

Moreover, as a patient's resistance is weakened, the disease may become more acute and go up into the next higher class. Or improvement may occur, either spontaneously or under treatment, and a nodular case may lose its skin manifestations and become anæsthetic. As mentioned before, tuberculoid types may develop into maculo-anæsthetic or mixed leprosy, though in two instances in the writer's own experience multiple lesions widely

scattered over the body surface (and including a lymphatic gland) had, without exception, the tuberculoid structure, two or more years after the beginning of the disease.

### Methods of Examination.

*Testing for Anæsthesia.*

When the test for anæsthesia is about to be made, the patient should be blindfolded and instructed to point with his finger to the spot he feels to be touched. Then with a folded piece of paper areas suspected to be anæsthetic are lightly touched. Muir recommends the preliminary shaving of the area to prevent sensation being provoked at the hair root, where it may be present, though absent on the surface. The patient may feel nothing or he may point to an adjacent area of skin, thus disclosing paræsthesia. If he feels nothing, the boundaries of the anæsthetic area are to be mapped out and other areas sought. The distribution of the anæsthesia is plotted on a chart. Next, sensation to an actual pin or needle prick should be tested. Loss of sensation to this stimulus is more likely to occur in infiltrated lesions than in the early macular lesions of the anæsthetic type.

*Examination of Nerve Trunks.*

In the examination of nerve trunks, first, without pressure, lightly roll the ulnar or peroneal nerve between the fingers and underlying bony surface. Note its hardness and the presence of any nodes. Next gently increase the pressure to find out if any pins and needles sensation is induced in the fourth and fifth fingers (in the case of the ulnar nerve). If no such sensation is induced, again increase the pressure until the patient does experience it or until it becomes obvious that no pressure the fingers can apply will induce that feeling. It is only in advanced disease of the nerve trunk that this sensation is altogether missing, though moderate degrees of diminution are very common and occur in some instances quite early. Feel also for hardening of any nerve trunk or superficial nerve in the region of active lesions or of anæsthetic areas.

*Testing the Sweat Function.*

Testing the sweat function by the injection of pilocarpine is rarely used nowadays, but if it be used, the demonstration of isolated areas where sweating does not occur may be of value.

*Percussion of the Long Bones.*

Percussion of long bones, according to Klingmüller,[3] may possibly disclose a degree of hyperæsthesia or tenderness in the bones. No personal experience of such a sign can be claimed.

*The Skin Lesions in Coloured Persons.*

In coloured patients the tints described elsewhere as occurring in various lesions are, of course, masked by the natural skin pigment. In such persons depigmentation is the rule and though in anæsthetic areas this is not as complete as in leucoderma, the presence of depigmentation together with anæsthesia or marked diminution of sensation should lead to a provisional diagnosis of leprosy and a further examination for signs of the disease.

*Examination of Smears.*

In the meantime smears will have been made from the nasal septum (lightly scarified) and from existing lesions. Muir recommends a smear made from the most dependent portion of the lobe of the ear in the absence of definite lesions, as the most likely area to be involved in the disease. Muir's clip smear is made by clipping from a patch of infiltrated and probably anæsthetic skin a piece about two millimetres deep. The under surface of this is rubbed on a slide. In this preparation bacilli are more likely to be found than in smears made from punctures.

*Histological Examination.*

The next step is the excision of a nodule or a portion of a plaque of infiltrated skin. This is best fixed in alcohol, as the formalin fixation is said to interfere with the staining reactions of the bacilli in some cases.

Klingmüller[3] prefers alcohol fixation, staining by means of carbol fuchsin for two to four hours at room temperature, and careful decolorization with 5% sulphuric acid. Counterstaining with methylene blue must be light and rapid. Serial sections will need to be examined when tuberculoid leprosy is suspected.

*Nerve Section.*

If still no bacilli can be found, a cutaneous nerve leading from an anæsthetic area or large lesion is to be excised and examined for giant cells and for bacilli.

*Potassium Iodide.*

The use of potassium iodide when no bacilli have been found is recommended by Muir. It is given twice a week in half a tumbler of water. The dose at the commencement is 1·3 grammes; this is doubled on each occasion until a reaction is obtained or until the dose reaches 16 grammes (240 grains). In the event of a reaction, hitherto unnoticeable foci become swollen and visible and involved nerves enlarge and become tender. If the reaction is pronounced, the temperature rises to 37·8° or 38·4° C. (100° or 101° F.). Bacteriological examination of reacting areas or tissue may reveal the presence of the *Bacillus lepræ*. (Even this failed to disclose bacilli in the last case, that of a patient still under treatment at the Royal Prince Alfred Hospital.)

*Erythrocyte Sedimentation Test.*

Finally, mention must be made of Muir's erythrocyte sedimentation test. A patient's blood mixed with a citrate solution and allowed to stand in a pipette fixed vertically, shows a more rapid sedimentation than normal if the patient has leprosy, especially if it is in the period of reaction.[2] This test is, however, more useful in forming a prognosis and in directing treatment than in diagnosis.

### Early Leprosy.

Taking the very early examples of leprosy first, one has to reckon on the possibility or probability of failure to find bacilli and must rely on other signs. These may require a combination of clinical and histopathological methods. The main clinical sign is anæsthesia and in the early cases Muir is emphatic that it is loss of superficial (epicritic) sensation that occurs, the deeper (protopathic) anæsthesia being a later development.

*Prodromal Erythemata.*

There is no anæsthesia in the prodromal stage and though the existence of fever with perhaps some aching or pain in the nerves, should arouse suspicion if the patient lives or has recently lived in a country where leprosy is endemic, it is hardly likely that leprosy will even be suspected in a country where the disease is rare or absent and to which the sufferer has come by chance. The history that the patient has come from a leprous country or district is significant and should cause regular reexamination. It is possible that a lucky examination of a smear taken from or just beyond the edge of the erythematous area, especially if the latter is extending, might disclose some bacilli.

*The Primary Lesion of Leprosy and Tuberculoid Lesions.*

Prodromal signs and symptoms are frequently missed or absent and the first observed sign of the disease is often the development of a flat button or small plaque, slightly, if at all, raised above the general surface of the skin. It is of a reddish-brown colour, very reminiscent of the colour of a syphilitic lesion, but the consistence is not firm and rubbery as in that disease, but soft and pulpy as in *lupus vulgaris*. Indeed, even the colour and form of the lesion may provide such a close reproduction of those of *lupus vulgaris* that anæsthesia alone affords a differentiation.

Unless correctly diagnosed and treated, the plaque slowly extends, maintaining its lupus-like appearance until it may be five centimetres or more in diameter after six months or so. The centre may clear and seem to sink, perhaps leaving a papery atrophic area. In this event the lesion may still retain its lupus-like appearance or tend

more to remind the observer of one of the papulo-serpiginous lesions that occur in the late secondary to tertiary stage of syphilis. But the soft, pulpy feel corrects that impression and, of course, by this time the anæsthesia is well marked. This lesion conforms to the tuberculoid type.

Other similar plaques may develop, generally in neighbouring areas of skin, or frank mixed or anæsthetic leprosy may develop. In one case, however ("H.C.P.," mentioned by Tebbutt[5] and the writer[6]), there developed nodular lesions, dome-shaped and indistinguishable, except by histopathological examination, from lesions of ordinary nodular leprosy.

The clinical and histopathological features of tuberculoid leprosy have been given briefly already and though there is much to describe, space will not permit. Full information can be found in Tebbutt's paper.[5]

### Nodular Leprosy.

The clinical signs available for the formation of a diagnosis in developed leprosy of the nodular type are so obvious that they need only be given very briefly here. Papules and nodules, more or less bright red when they first appear and becoming dark red-brown to brown as they grow older, appear in various parts of the patient's skin surface. These may ulcerate and then cicatrize or become gradually absorbed without ulcerating, to leave pale ivory-coloured areas varying from the diameter of a pea to that of the palm of the hand. The edges of such patches are often more deeply pigmented, while the centre is covered with thin, atrophic, papery epithelium. These papules or nodules may persist or even enlarge for months or be succeeded by fresh crops of similar lesions. The accumulation of nodules in the eyebrows, *alæ nasi*, lips and ears gives the leonine facies illustrated in almost all the text books. The hair of the eyebrows and face is diminished or lost, but the scalp is rarely affected with nodules and the hair of this region is not lost.

In addition to dome-shaped nodules, large plaques of infiltration not infrequently appear; after resolution they leave large, pale yellow, atrophic areas as described above.

Leprous rhinitis, pharyngitis and, as a late and dangerous development, laryngitis due to leprous infiltration, occur in varying degrees and frequency.

The conjunctiva and cornea may be invaded directly by extension from the skin, or an irido-cyclitis may result from the deposition of blood-borne bacilli. Blindness may occur from leprous infiltration of the cornea (leprous pannus) or from inability to close the eyes, due to paralysis of the *orbicularis oculi* muscles.

Anæsthetic areas are numerous and occur even in early stages of the development of nodular lesions which are usually insensitive to deep pricking with a needle. In addition to this, and especially on the ivory-coloured patches mentioned above, anæsthesia or diminished sensation is an almost regular feature.

Similarly, the nerve trunks, especially the ulnar and peroneal, but also the auricular and other nerves, are found to be hard, somewhat thickened and sometimes to contain irregular nodosities.

In the reactionary periods that frequently occur when the disease is severe and which are accompanied by fever up to 39·5° C. (103° F.) or even more, the lesions in the skin attain a brighter red colour, only to fade back to the deeper brown when the reactions subside. Or, as not infrequently happens, as the result of the attainment of some variety of allergic resistance, according to Jadassohn's[4] interpretation, they may rapidly shrink and disappear, leaving the familiar atrophic patch behind them. During these reactions the nerve trunks are frequently in a state of acute neuritis and are then acutely tender to touch.

Muscular paresis is common, including that of the *interossei*, the *orbicularis oris* and *orbicularis oculi*. Paralysis of the *orbicularis oris* muscle results in a flabby mouth drooling saliva, and paralysis of the *orbicularis oculi* allows dust and trauma from other causes to destroy the cornea and produce blindness.

Leprous orchitis is common in cases of moderately advanced disease. Swelling and tenderness of the testes are especially common during reactions. The ovaries, however, are rarely affected.

Ulcerations may cause great damage, such as the loss of fingers or toes, or even a hand or foot, but such amputations may be of trophic origin due to nerve changes.

If the victim survives the acute (nodular) stage, his malady, after a lapse of eight to fifteen years, gradually subsides to a stage in which infiltrative lesions no longer appear in the skin, bacilli are scarce and the signs are all of the nerve type, anæsthetic or paralytic. At this point hearing may be practically the only sense left him, and he is blind, helpless, anæsthetic and paralysed, a hopeless wreck waiting for the merciful release of death. Generally the brain remains clear, but in one case within the writer's experience a variety of senile dementia made the final stages less distressing, at least to the patient himself.

During all but the final stages the lesions provide in smears or in sections innumerable bacilli and have the structure described in "1" under "Pathological Classification." Bacilli are also obtainable from nasal secretion, lymphatic glands and sputum (especially if the larynx is involved).

### Maculo-Anæsthetic Leprosy.

The anæsthetic form may be preceded by the outbreak of erythematous patches sometimes covering large areas, for example, the whole of one buttock. These fade rapidly, perhaps leaving some ivory-yellow pigmentation. These prodromal signs may be accompanied by fever, but generally when the condition is going to develop along more or less exclusively anæsthetic lines, the pyrexia is mild or absent. Tenderness along the nerve trunks near by is frequently present and betrays a state of leprous neuritis. Insidiously, patches similar to those described as occurring in the nodular form appear, generally without any previous palpable infiltration. These are pale ivory in the centre with a darker brownish periphery. It may be possible to find a few bacilli in smears taken from the edge or from apparently sound skin immediately outside the edge of the patches, but frequently attempts to find bacilli in smears taken from the central area fail entirely. These patches are always anæsthetic to light touch and generally to a deep prick. Anæsthesia also appears independently from the patches and the fingers and toes are frequently found to be insensitive, as are other areas on the limbs and trunk. Gradually the anæsthetic involvement extends so that all the fingers and toes and even great parts of the surface of the hands and feet may be affected. Varying areas on forearms and legs become involved in a kind of glove or stocking anæsthesia. The face, trunk *et cetera* are all affected in the same way to a varying and irregular extent.

At the same time paresis and atrophies of muscles slowly develop. The *orbiculares oris* and *oculi* are frequently involved. This paralysis may ultimately cause a mask-like, expressionless face, with lips incapable of retaining saliva, and eyelids that cannot be closed. The damage resulting to the cornea, which may also be anæsthetic, has been described already.

The interosseal muscles of hands and feet and, to a less degree, muscles of the forearm and leg, facial muscles and muscles in other areas, become paretic and wasted. The full development of this atrophy in the hands produces the "*main en griffe*," while in the foot wasting and paresis together with anæsthesia produce in some instances a steppage gait. Trophic ulcers on the feet and elsewhere are common in the advanced stages, and blebs or pemphigus-like bullæ may appear in some cases, especially on the hands and feet. How far these may be due to trauma and how far to trophic influences is very difficult to decide, because the patient's hands and feet are generally by this time almost totally anæsthetic and he injures himself by burning or by knocks without realizing it.

Loss of fingers or toes or of even more extensive portions of the extremities may occur as a result of trophic ulcers or septic contamination of them, or may result from loss of the trophic function in an involved nerve, causing gradual rarefaction and absorption of tissues and bones.

All these signs except those in the very early stages are traceable to damage sustained in the peripheral nerve trunks up and down which the leprous infection slowly creeps. In the earlier and relatively active stages bacilli can be found in cutaneous nerves and in the thickened nerve trunks, and giant cells are occasionally found.

During this period of involvement of the peripheral nerves the trunks gradually harden and thicken and here and there irregular nodes become palpable. In the ulnar and peroneal nerves these changes can be felt with the fingers at the point where the nerves pass over the condyle of the humerus and the neck of the fibula respectively.

In comparatively early and active stages the nerve trunks may be tender to touch, but gradually they become more and more insensitive until in long standing cases no pins and needles sensation can be produced, even by severe compression of the nerve between the examiner's fingers and the bone. Sometimes in well established disease the pressure may be so severe that the snap occasioned by the escape of the nerve from between the fingers and the underlying bony surface can be heard all over the room. Even then no sensation which accompanies the compression of normal nerves is felt by patients with advanced disease.

After a very long course, twenty years or more, the patient drifts almost imperceptibly into the bedridden, helpless, hopeless stage described as terminal also in the nodular variety.

### The Mixed Type of Leprosy.

In the mixed type of leprosy, which is probably the commonest, there may be any combination in different proportions of the signs and symptoms that occur in the nodular and maculo-anæsthetic forms. The end result, if the disease continues to progress, is the same, unless intercurrent accident or disease brings the patient to an earlier end.

Such is the course of the disease in the classical types if left unchecked. But it must be remembered that long periods of remission or even spontaneous arrest of the disease may occur by the development of some sort of immunity, or as the result of treatment, including the use of specific drugs and improvement in nutrition and hygiene. According to Muir[2] these improvements are the consequence of allergic reaction which may be induced or accentuated by treatment. According to Jadassohn[4] also, the natural defence and the mechanism by which established infection with leprosy is resisted or overcome, is a capacity to react in an allergic fashion towards an infection (*Reactionsfähigkeit, Allergiesierbarkeit*). Whether this will prove to be correct in the ultimate judgement of science we cannot at present predict with certainty.

### Differential Diagnosis.

*Nodular Leprosy from Syphilis or Yaws.*

The colour may be identical in lesions of leprosy, syphilis and yaws, but the leprous nodules are soft and pulpy, the syphilitic have a rubbery firmness. Anæsthesia and the finding of acid-fast bacilli will decide. The Wassermann (if a suitable antigen be used) and more especially the Kahn test do not yield positive results in leprosy except when syphilis or yaws coexists. This is different from previous teaching, but examination of a large series of cases has convinced Muir that it is true beyond peradventure.

*Tuberculoid Leprosy from Lupus Vulgaris or Sarcoid of Boeck.*

The distinction of tuberculoid leprosy from *lupus vulgaris* or sarcoid of Boeck may be impossible to make by histopathological means. The presence of anæsthesia, the ultimate discovery of bacilli after a patient search of serial sections, the failure to produce tuberculosis by inoculation of a portion of involved tissue into a guinea-pig, or the ultimate finding of bacilli in a superficial nerve will provide the diagnosis of leprosy, but the process may require patient work for weeks or months.

*Anæsthetic Leprosy.*

(*a*) *From leucoderma*: The leprous macule is yellowish and never so absolutely devoid of pigment as is leucoderma. Moreover, in the latter there is no anæsthesia, which is well marked in leprous macules.

(*b*) *From syringomyelia*: The dissociation of heat and cold sensations observed in syringomyelia does not occur in leprosy. The patch is anæsthetic to all forms of stimuli —heat, cold, light touch and trauma.

Some of the cases of Morvan's disease described in the past as occurring in Brittany and elsewhere are now suspected of having been in reality attenuated forms of leprosy in an expiring endemic.

From the results of injury to nerve trunks, leprosy can be distinguished by the history, the symmetrical distribution of nerve lesions and the finding of bacilli.

### Serological Tests.

Attempts have been made to secure results by using tests for deviation of the complement, employing extracts of leprous tissue as antigen, but although some success in advanced nodular leprosy has been claimed, the early and anæsthetic cases fail to respond, and therefore this method is without practical value. Similarly, the attempts to obtain a skin test analogous to the von Pirquet test have been disappointing. Until culture is surely achieved, however, a final decision on the latter method cannot be given.

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## British Medical Association News.

### SCIENTIFIC.

A MEETING OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the British Medical Association Rooms, Adelaide Street, Brisbane, on November 7, 1930, DR. S. F. MCDONALD, the President, in the chair.

### Some Aspects of Radiation Treatment.

DR. B. L. W. CLARKE read a paper entitled: "Some Aspects of Radiation Treatment" (see page 303).

DR. L. MCKILLOP thanked Dr. Clarke for his address. Dr. Clarke had spoken as a radiologist; Dr. McKillop spoke as a surgeon. Dr. Clarke had had considerable experience in radium treatment. Dr. McKillop, however, did not

think that the application of radium was the correct treatment for some epitheliomata. As far as skin cancers were concerned, radium treatment was satisfactory for rodent ulcers, but not always for epitheliomata, as in these latter one had to consider the lymph supply. In three instances Dr. McKillop had purposely excised lip scars resulting from epitheliomata supposed to have been cured by radium. Histological examination of the material excised revealed living cancer cells. Sometimes one wondered why patients who had been operated on, say, six or seven years previously, for, say, carcinoma of the breast, and who had apparently done well, should suddenly start to go down hill and develop metastases in the spine. He considered that as a cancer grew the patient developed an immunity, but the cancerous growth almost invariably outstripped the immunity and killed the patient. Spontaneous cure of cancer was said to occur; it was difficult to explain this, except by the theory of immunity. The patients affected by recurrences after a long period of apparent cure, stated that the recurrence took place after a very severe illness or bodily injury, which obviously depleted their resistance and broke down the immunity against cancer. Metastases from the growth then appeared. Dr. Clarke had said that dissection of the glands of the neck opened up the lymph channels. This statement was not correct if a proper dissection were done. The block method should be used, in which the surgeon started his dissection, for example, in the neck, low down near the clavicle, and worked up. This set up a condition of fibrosis in the lymph channels low down and blocked the spread of the disease. A most important point in dealing with the cancer problem in Australia was the question of prevention. Clinical research had shown that the beginnings of a cancer were not so obscure as formerly thought. A cancer "irritability" was just as local a disease as was a boil or a carbuncle. It was essential for the patient to be placed under treatment in this stage, but this required the education of the public. Statistics in Australia showed that cancer was on the increase; this was accounted for by some in two ways: (i) that people were living longer than before, (ii) that there were better means of diagnosis. Dr. McKillop did not consider that either of these explanations was correct. It had been proved that the incidence of cancer was increasing all over the world, and Australia showed the third highest death rate. He thought the Editor of THE MEDICAL JOURNAL OF AUSTRALIA could use the journal to stimulate interest in the earlier diagnosis of cancer. It was for the general practitioner to make the early diagnosis; the specialist only saw the patient at a late stage. The general practitioner should be able to recognize the early signs and the public should be taught them. The mortality from cancer would then be lessened considerably. He thought that "cancerphobia" was a bogy; even if it occurred, he considered that the earlier diagnosis of a few cases of cancer outweighed the ill effects of a large number of cases of "cancerphobia."

DR. C. DE MONCHAUX also wished to thank Dr. Clarke for his paper. Dr. de Monchaux was particularly interested in radium therapy and would like to say a few words with regard to the physics and biological action of radium. Dr. Clarke had said that the alpha and beta rays from radium had wave lengths, but this was not quite correct. The alpha and beta rays were particulate, that is, they were matter (the alpha rays consisted of positively charged atoms of helium and the beta rays were simply electrons or negatively charged particles of matter), whereas the gamma rays were, like light, ultra-violet rays and X rays, non-material, being electro-magnetic vibrations. Simply expressed, all these vibrational rays were energy forms or manifestations and the energetic effect they produced was represented and determined by their wave length (the shorter the wave length, the greater the energy or power of doing work). Th alpha and beta rays too possessed energy (the energy of particles of matter in very rapid motion), but these rays were not electro-magnetic vibrations and so, strictly speaking, could not be said to have wave lengths. Actually the alpha rays could be absorbed altogether by a thin sheet of paper and it could be taken that the beta rays were approximately one hundred times more penetrating than the alpha rays (one hundred times more energetic), and that the gamma rays were one hundred times more penetrating than the beta rays.

He agreed with Dr. Clarke that the biological effects of the gamma rays (the ones chiefly concerned in radium therapy) on the body tissues, either normal or neoplastic, could be summed up as follows: (i) A stimulative or provocative effect, obtained by small doses; (ii) an inhibitive effect, really intermediate between (i) and (iii); (iii) a destructive or lethal effect, which was the result of large doses. It might be said that there were two chief biological effects (and this applied equally to any of the energy forms, such as sunlight, ultra-violet light, Röntgen or gamma rays), the provocative, which induced a reaction on the part of the tissues irradiated, and the destructive, which simply killed the cells of the irradiated tissue, whether healthy or cancerous. The secret of successful radium therapy was to obtain a happy medium between these two biological effects of stimulation and destruction. The desideratum was to destroy as much as possible of the neoplastic tissue without damaging the healthy cells around and to provoke the usual healing reaction in the circumjacent normal tissues as well as in the peripheral portion of the neoplastic tissue. This led to the production of fibroblasts and fibrous tissue and the formation of a good healthy scar. Such desirable result could be obtained only by a proper and suitable method of application of the radium and by due and strict observance of the four big factors in radium therapy: the amount of radium or radon used, in other words, the intensity of irradiation; the time or period of irradiation; the distance of the source from the lesion; the screenage or filterage used. Of these four factors the greatest and most important was that of intensity. The total quantity of irradiation was expressed by physicists as the product of the intensity multiplied by the time ($Q = I \times T$), but the effects depended much more on the factor intensity than on the factor time. For example, the application of ten milligrammes of radium element for one hour had relatively a much greater biological effect than the application of one milligramme of radium for ten hours. So the intensity or amount of radium used was the most important consideration in radium therapy or X ray therapy.

Dr. de Monchaux stressed the need for taking every care and proper precautions when using and handling radium and similar substances. Someone had described radium as being "worse than white-hot" in its powerful effects on tissue cells; this should never be forgotten by radium workers, especially as radio-active bodies looked apparently inert and harmless and exerted no obvious or immediately perceptible effect.

DR. V. MCDOWALL said, in regard to Dr. Clarke's remark concerning necrosis of the jaw, that all unhealthy teeth should be removed before radium needles were put in the tongue or buccal cavity, otherwise bone necrosis would be likely to occur.

DR. GRAHAM BROWN, in thanking Dr. Clarke for his paper, said that the subject of cancer and its treatment was always interesting and worthy of discussion.

Dr. Brown spoke of the excellent work which had been done by Dr. Val. McDowall at the Brisbane General Hospital. This work had been done at a great sacrifice of time and he considered that the public and the profession owed Dr. McDowall a debt of gratitude. He said that he objected on general principles to the treatment of cancer by radiologists, although he recognized that in Brisbane up to the present time one had no grounds to make serious complaint. Certainly a large experience had been obtained at the General Hospital Clinic and to a less extent at the Mater Misericordiæ Hospital Clinic, but he considered that no one in Queensland could honestly claim to be an expert in radium treatment of cancer in all its aspects. He thought that the question was: "Were we doing the best we could?" He did not think so. There were such wonderful opportunities overseas for training that he considered that any practitioner who was seriously attempting radium treatment of cancer should make it his

endeavour to visit such clinics in order to see the best men at work and to learn their technique, and later to be ready to alter the technique according to the changes made by its originators. To rush blindly into radium work when one did not know even the danger to oneself by such work was foolhardy. He had seen practitioners handling radium needles and allowing their assistants to handle them in such a way that indicated that they did not even know the primary facts about the elements. Dr. Graham Brown considered that specialists in the several departments of surgery were the ones who should make themselves competent in the application of radium to the regions of the body falling within their several specialties, and he maintained that, situated as they were in Queensland, these men should learn directly from the leaders in this work in their particular specialty. And so he said that he would like to see more specialization in radium clinics. The radiologist would be fulfilling his function in looking after the radium and its distribution, and perhaps should be consulted on the question of dosage, but an expert in surgery should do the actual implantation of needles and tubes into the various regions. As an example, he claimed that he himself could introduce radium needles into the base of the tongue, tonsils, palate and similar places in a better manner than any radiologist. He did not agree that radium was by any means the one and only sheet-anchor in the treatment of cancer.

He made these remarks with all due respect to Dr. Clarke and other radiologists and in the interest of science and without animosity. He would like to suggest that the radiologists had quite enough to do in supervising the care and distribution of radium and its external application (bringing it into line with X radiation) and should not dabble (for that was what it amounted to) in the surgery of its introduction into the tissues.

DR. J. BOSTOCK said he did not profess to know much about radium. He was very interested in Dr. McKillop's remarks on the prophylaxis of cancer. He foresaw a harvest. The last boost for the early recognition of cancer had resulted in a number of cases of cancerphobia falling to the neurologist. Anything like the last crusade was to be deprecated. It must be done cautiously and the facts of suggestion and persuasion gone into very carefully.

DR. E. S. MEYERS, after thanking Dr. Clarke for his paper, said that he wished to stress two points. The first had been raised by Dr. Clarke; it referred to the removal of the glands of the neck by surgery. The statistics of the late Sir Herbert Maitland, the late Sir Henry Butlin, and Crile, published before radium was used in the treatment of malignant disease in the neck, had never been surpassed. He would like actual details of Dr. Clarke's patients. He considered that to do as Dr. Clarke had suggested would be quite wrong; such methods were not supported by the clinics of the old world; he believed that, as a result of their application, there would be no survivals after one year. The second point was raised by Dr. McKillop regarding the preventive side of the treatment of cancer. This matter was receiving the attention of the Council. To forward the work it was suggested that a full-time medical officer be appointed to specialize in the prevention of the disease, to see that the public was well informed and to promote the education of the general practitioner on this question. Dr. Meyers considered that this matter was not being pushed as it should be. He supported very strongly Dr. McKillop's recommendation for early treatment.

DR. CLARKE in reply said he quite expected criticism when he made remarks about surgery of the neck. In the cancer clinics he saw the recurrences after operation. He did not see the patients cured by operation. The question arose whether the technique of operation which had been carried out could be improved. On the other hand, he had seen patients apparently free from symptoms for long periods after irradiation only.

In reply to Dr. Brown he said that the ideal was cooperation between the surgeon and the specialist. He admitted that he would not even attempt to put radium needles in the larynx without the aid of a surgeon. More specialists should be roused to take an interest in radium work. He considered the radiologist was quite capable of dealing with a rodent ulcer. He thought the majority of medical practitioners were doing their best in the treatment of cancer.

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A MEETING OF THE SOUTH AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held on August 28, 1930, at the Darling Building, Adelaide, DR. C. E. C. WILSON, the President, in the chair.

### Poliomyelitis.

DR. JEAN MACNAMARA, of Melbourne, had been invited to read a paper on the treatment of poliomyelitis by means of human immune serum.

In introducing Dr. Macnamara, Dr. Wilson, the President, explained that the Council of the South Australian Branch of the British Medical Association had realized the importance of poliomyelitis and the fact that the recognition of the preparalytic stage and serum therapy had passed out of the experimental stage to accepted therapeutics. At the Winnipeg meeting, then proceeding, a morning session of several sections was to be devoted to this subject.

Dr. Macnamara, in thanking the President and the members of the Council for the invitation to Adelaide, wished to compliment the Branch on the fact that they were anxious to make preparation in anticipation of any epidemic. During the past six years South Australia had had very few cases to compare with the six hundred which had occurred in that time in Victoria. This number and the interest of the medical profession throughout Victoria had given the Poliomyelitis Committee of that State opportunity for experience and made the work much easier. It afforded great pleasure to Dr. Macnamara to be able to save the doctors undertaking the work in other States some of the difficulties of technique and administration which resulted from lack of precedent or guiding literature in the initial work in Victoria. This year steps had been taken to introduce serum therapy in New South Wales, and in Tasmania, in the epidemic of the autumn, serum had been used when patients sought treatment early.

In her paper Dr. Macnamara used the lantern slides and cinema films prepared to illustrate the papers read at the Sydney Session of the Australasian Medical Congress (British Medical Association). After outlining the history of serum therapy since 1911 Dr. Macnamara discussed the microscopical pathology and illustrated her remarks by slides lent by Dr. Reginald Webster, of Melbourne, prepared from cords of monkeys and children in the 1918 epidemic of Melbourne. These demonstrated how the morbid process of engorgement, leucocytic aggregation, spoiling of special cells involves the meninges, the sensory ganglia, the posterior columns, the white matter, though the process is most intense around the anterior horns. Two slides were shown—one a low power microphotograph and the second a high power microphotograph of a field from the anterior cornu of the spinal cord of a monkey killed some days after paralysis had occurred. In these numerous ganglia cells were seen, but the majority, while still preserving the outline of a ganglion cell, appeared as if "dotted in"; others were occupied by neurophages; others appeared normal; on others no nucleus could be seen. These slides emphasized the hopelessness of expecting any drug or serum administered after these changes had occurred to restore nerve cells to function. They stressed the need to recognize and differentiate the disease from others before these changes had occurred.

This had been made less difficult by the fact that the reaction of the human organism to the poliomyelitis virus was changing and had changed appreciably within the last three decades. Dr. Macnamara had had the good fortune of discussing this with some of the older clinicians of Melbourne, Dr. Jeffreys Wood and Sir Richard Stawell, and they had told her that the description found in the older text books was accurate when it was written. The usual story, the common story, in 1898 and 1908 was as follows. A child, previously well, would go to bed well and be found in the morning with a paralysed limb, but in the last five years in Australia and in America this had not occurred. The paralysis had been preceded by some days of illness, either of a straggling type or the more definite dromedary type. This longer preparalytic stage gave more

opportunity for early recognition of the disease and, fortunately, certain symptoms were present which made it possible to recognize this preparalytic stage clinically, and certain changes occurred in the cerebro-spinal fluid which confirmed or disproved the clinical findings.

The early symptoms and the method of examination were dealt with in detail, for, in order to diagnose poliomyelitis before paralysis, the condition had to be considered and the spine sign deliberately elicited. No heralding symptoms called attention to the advent.

The method of serum administration, intravenously and intrathecally, was described. (For details see THE MEDICAL JOURNAL OF AUSTRALIA, December 14, 1929.) The danger of delay between withdrawal of cerebro-spinal fluid by lumbar puncture and administration of serum was illustrated by the histories of cases in which this had occurred.

Temperature charts of some of the patients treated by serum were demonstrated. When an adequate dose had been given, the temperature should fall to normal within twenty-four hours.

Dr. Macnamara did not describe the method of obtaining blood or preparing serum. At the inception of the work in Victoria it had been realized that if serum therapy was to have any future in Australia a product must be obtained which could be stored in country districts in anticipation of a demand. The cooperation of Dr. F. G. Morgan, of the Commonwealth Serum Laboratories, was sought and a technique elaborated. Serum prepared by this method had been tested three years after preparation and found to retain its viricidal properties. A cinema film illustrating experimental poliomyelitis in the monkey was shown.

Dr. Helen Mayo and Dr. F. Le Messurier thanked Dr. Macnamara for her paper.

A committee was formed to arrange for provision of serum in South Australia. The committee consisted of: Dr. F. S. Hone, Dr. F. N. Le Messurier, Dr. E. B. Jones, Dr. H. Mayo, Dr. D. L. Barlow, Dr. L. V. Bull, Dr. L. O. Betts, Dr. R. Hone.

## MEDICO-POLITICAL.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society Hall, East Melbourne, on February 4, 1931, DR. VICTOR HURLEY, the President, in the chair.

### Financial Statements.

DR. C. H. MOLLISON, the Honorary Treasurer, presented the statement of receipts and payments of the Victorian Branch of the British Medical Association and of the Medical Society of Victoria for the period January 10, 1930, to January 6, 1931. Both statements are published herewith. In presenting the statements which were received and adopted, Dr. Mollison spoke as follows:

I have once again the honour of presenting to you the only audited financial statements of the Victorian Branch of the British Medical Association and of the Medical Society of Victoria. As compared with this time last year, the combined accounts show a loss of £12; however,

BRITISH MEDICAL ASSOCIATION — VICTORIAN BRANCH.

**Statement of Receipts and Payments for Period from January 10, 1930, to January 6, 1931.**

| RECEIPTS. | £ s. d. | £ s. d. |
|---|---|---|
| 1930, January 10— | | |
| To Balance, National Bank of Australasia, Limited | | 512 10 10 |
| „ Cash in Hand | | 12 0 0 |
| 1931, January 6— | | |
| To Subscriptions— | | |
| Metropolitan members | 3,561 11 6 | |
| Country members | 1,572 3 6 | |
| Junior members | 379 7 9 | |
| | | 5,513 2 9 |
| „ Duplicating Department | | 50 9 10 |
| „ Rentals from Hall | | 43 10 0 |
| „ Dividend, Guarantee Fund | | 6 5 0 |
| „ Sale, Hospital Report Forms | | 4 10 9 |
| „ Interest on Loan to British Medical Insurance Company | | 5 16 8 |
| | | £6,148 5 10 |

| PAYMENTS. | £ s. d. | £ s. d. |
|---|---|---|
| 1931, January 6— | | |
| By Medical Society of Victoria | | 2,885 19 3 |
| „ *The British Medical Journal* | | 1,702 14 6 |
| „ Rebates to Subdivisions | | 91 5 6 |
| „ Salaries— | | |
| Assistant Secretary | 119 3 4 | |
| Library Assistant | 174 8 4 | |
| Assistant Typist | 112 2 6 | |
| | | 405 14 2 |
| „ Clerical Assistance | | 15 12 11 |
| „ Postages, Duty Stamps *et cetera* | | 99 1 4 |
| „ Printing | | 83 14 9 |
| „ Stationery | | 69 12 4 |
| „ Commission on New Members | | 3 0 0 |
| „ Advertising | | 10 10 0 |
| „ Audit Fee, 1929 | | 5 5 0 |
| „ Telephone | | 15 4 1 |
| „ Legal Expenses | | 8 8 0 |
| „ Bank Charges *et cetera* | | 7 11 2 |
| „ Electric Light and Power | | 18 2 8 |
| „ Federal Committee Expenses | | 145 0 6 |
| „ Furniture | | 21 5 0 |
| „ Cost of Report | | 15 15 0 |
| „ Professor Windeyer's Lecture | | 11 1 0 |
| „ Lanternists | | 8 1 0 |
| „ Binding Booklets (*re* Sir G. Syme) | | 6 7 4 |
| „ Library Catalogues | | 4 2 6 |
| „ Expenses of Representatives | | 10 0 10 |
| „ Sundries | | 11 8 3 |
| „ Balance, National Bank of Australasia, Limited | 481 8 9 | |
| „ Cash in hand | 12 0 0 | |
| | | 493 8 9 |
| | | £6,148 5 10 |

Compared with the Books and Accounts of the British Medical Association—Victorian Branch—and found to be in accordance therewith.

C. STANTON CROUCH, *Secretary.*
CRAWFORD H. MOLLISON, *Honorary Treasurer.*

J. V. M. WOOD & COMPANY,
Chartered Accountants (Aust.).

Melbourne, January 28, 1931.

MEDICAL SOCIETY OF VICTORIA.

**Statement of Receipts and Payments for Period from January 10, 1930, to January 6, 1931.**

| RECEIPTS. | £ s. d. | £ s. d. |
|---|---|---|
| 1931, January 6— | | |
| To Transfer from British Medical Association, Victorian Branch— | | |
| Subscriptions | 2,675 1 9 | |
| Interest on Debentures | 210 17 6 | |
| | | 2,885 19 3 |
| „ Medical Agency | | 481 14 4 |
| „ Indent Agency | | 96 2 8 |
| „ Guarantee Fund | | 78 6 11 |
| „ Balance, National Bank of Australasia, Limited | | 73 16 5 |
| | | £3,615 19 7 |

| PAYMENTS. | £ s. d. | £ s. d. |
|---|---|---|
| 1930, January 9— | | |
| By Balance, National Bank of Australasia, Limited | | 92 16 9 |
| 1931, January 6— | | |
| By THE MEDICAL JOURNAL OF AUSTRALIA | | 1,636 17 6 |
| „ Interest on Building Fund Debentures | | 421 15 0 |
| „ Salaries— | | |
| Secretary | 800 0 0 | |
| Library Clerk | 72 0 0 | |
| Caretaker | 100 0 0 | |
| Bonuses to Staff | 20 0 0 | |
| | | 992 0 0 |
| „ Library, Journals and Binding | | 123 2 0 |
| „ Postages | | 99 1 5 |
| „ Rates, Taxes and Insurance | | 42 15 3 |
| „ Light and Power | | 18 2 8 |
| „ Audit Fees | | 17 17 0 |
| „ Commission on Agency | | 27 5 9 |
| „ Telephone | | 15 4 1 |
| „ Entertaining guests | | 20 14 3 |
| „ Bank Charges | | 1 10 0 |
| „ Repairs— | | |
| Plumbing | 20 10 6 | |
| Furnishings | 0 13 6 | |
| Typewriter | 6 8 0 | |
| Electrical | 2 9 3 | |
| | | 30 1 3 |
| „ Portable Projector | | 53 1 8 |
| „ Sundries | | 23 15 0 |
| | | £3,615 19 7 |

Compared with the Books and Accounts of the Medical Society of Victoria and found to be in accordance therewith.

C. STANTON CROUCH, *Secretary.*
CRAWFORD H. MOLLISON, *Honorary Treasurer.*
Melbourne, January 28, 1931.

J. V. M. WOOD & COMPANY,
Chartered Accountants (Aust.).

that is comparatively unimportant, but what I would like to impress on you is that the subscriptions of members are quite inadequate to meet all the expenses of the combined bodies. If you turn to the statement of the Medical Society you will find that no less than £656 was paid in from outside sources, principally from the Medical Agency; in the future, for the extra money that we require, we must look to the British Medical Agency of Victoria and, if necessary, to the British Medical Insurance Company of Victoria, Limited, both of which companies owe their origin to the Council of this Branch.

An increase in the subscription rates, I think you will agree, for the present at any rate, would be unwise. I would therefore urge all members to patronize and support the agency and insurance companies established by the Council, more especially as their funds will be used for the advantage and in the interests of members of the Branch and Medical Society of Victoria.

## NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

Waddington, Roland James, M.B., B.S., 1928 (Univ. Sydney), Western Suburbs Hospital, Croydon.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Child, Albert George, M.B., B.S., 1928 (Univ. Sydney), 19, Ramsay Street, Haberfield.

Gordon, Charles Patrick, M.B., B.S., 1930 (Univ. Sydney), Sydney Hospital, Sydney.

Hunt, Elinor Sydney, M.B., Ch.M., 1926 (Univ. Sydney), 132, Victoria Street, Ashfield.

O'Connor, John Mackey, M.B., B.S., 1929 (Univ. Melbourne), c.o. Dr. E. F. McCarthy, Major's Bay Road, Concord.

Pottinger, George Wilfred, M.B., B.S., 1929 (Univ. Sydney), 29, Tunstall Avenue, South Kensington.

The undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Young, William Donald, M.B., B.S., 1928 (Univ. Melbourne), Talbot.

Ewing, Geoffrey Orr, M.B., B.S., 1928 (Univ. Melbourne), Alfred Hospital, Prahran, S.1.

# Correspondence.

## THE WAR AND SIR NEVILLE HOWSE'S PART THEREIN.

SIR: Many members of the medical profession in Victoria, those who served in the Great War, as well as others who did not, have discussed whether any notice should be taken of the deplorable taste and the gross inaccuracies of the criticisms of Dr. J. W. Springthorpe of the work of the late Sir Neville Howse in the Australian Army Medical Services in the Great War.

I agree with Dr. Aspinall that Sir Neville would have wished that no action be taken so far as he was personally concerned. Nevertheless, in respect of his work, as well as of his memory, those who were privileged to serve under him feel that their protest should be recorded and that his reputation may safely be left to posterity to judge.

Yours, etc.,

VICTOR HURLEY.

12, Collins Street,
Melbourne,
February 17, 1931.

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SIR: As I stated recently at a council meeting of the Victorian Branch of the British Medical Association, my opinion of the extraordinary attack on the capability of Major-General Sir Neville Howse, V.C., made by Lieutenant-Colonel (retired) Springthorpe, is that it merits no reply, attractive though a counter-attack might be. However, so many letters of protest have appeared in your columns that the silence of one who was closely associated with Sir Neville and who, as a subordinate, had at times to present policies at variance with his, might be misunderstood, I desire, therefore, to add my strong protest against Lieutenant-Colonel Springthorpe's letter. His charges merit no refutation, for, as has been pointed out by previous correspondents, they are blank; the failures with which General Howse is credited were almost entirely in matters not under his control. His successes on the contrary made him one of the outstanding Australians of the Great War and one to whom the debt of the Australian Imperial Force is immense. For myself, after intimate knowledge of him as a soldier, I regarded him as the most wonderful personality I have had the good fortune to meet; as for not being a good director of medical services, after considerable personal contact with several of the holders of a similar position on active service, this statement fills me with amusement. Let it be said that brother officers of Lieutenant-Colonel Springthorpe do not honour nor thank him for his meaningless attack on one of the most remarkable and self-sacrificing medical administrators any military force has ever known, and, be it remembered, a brother officer, too, of the attacker, the deep regret for whose death has not yet been effaced by time.

The admiration, respect and regard of the officers of the Australian Army Medical Corps who served under him for General Howse may not be generally known, but they were practically universal; on behalf of those officers of this State still serving, I am taking the liberty of emphasizing their sentiments in refutation of the regrettable letter which has prompted this correspondence.

Yours, etc.,

RUPERT M. DOWNES.

Victoria Barracks, Melbourne,
February 18, 1931.

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SIR: A friend, on reading Lieutenant-Colonel Springthorpe's introductory quotation in his letter of January 31, 1931, recalled the humorous emendation thereof: "*De mortuis, nil nisi* bunkum."

It is interesting to note that in his diary, "the *ipsissima verba* of which are already in the hands of authorities and deposited in the Mitchell Library," Lieutenant-Colonel Springthorpe writes:

> 16th Sept., 1915.—Talk with General White *re* the need of strong Australian D.M.S. He asks me do I know anyone who could fill it. I suggest Howse as the only likely one I know. He says he will wait to see Fetherston (which he did).

Colonel Springthorpe evidently reaffirms this opinion in his letter (THE MEDICAL JOURNAL OF AUSTRALIA, January 31, 1931) in which he states:

> Thus "Australia must have its own D.M.S., A.I.F."—one who at least would carry weight, has had experience and was energetic. The only man available was recognized to be Howse. After due consultation and many difficulties, he was appointed and gazetted.

Most of the Australian Army Medical Corps would have said: "So say all of us."

Undoubtedly Sir Neville Howse possessed that elusive, indefinable quality or assemblage of qualities, personality, which makes a person what he is, as distinct from other persons—distinct personal or individual character, especially when of a marked or notable kind.

With regard to the choice of the site of the Mena Camp, Colonel Howse was not responsible.

On September 14, 1915, having, on the recommendation of the Sanitary Commission Colonels Hunter, Balfour, Buchanan and Dudgeon, through the P.D.M.S., General Baptie, V.C., been appointed Specialist Sanitary Officer on the staff of Surgeon General Ford, D.M.S., Egypt, I was told by him that Colonel Springthorpe and others had alleged that the Australian camp during the previous winter was unhealthy.

The D.M.S., Egypt, asked me to make a report on the camp, saying he did not want a long report, but a short, concise statement on one of the little grey slips of paper ever ready on his desk. On being told that I could report even without going out to the camp, and as I actually wrote after further inspection that the site was insanitary and having stated:

> In my opinion the area at Mena where the Australians were encamped last winter is not suitable for a camp, as after high Nile, even if the water does not overflow its banks, the subsoil water is so high that in the Mena area, as was the case last winter, the sand three inches below the surface was damp.

General Ford shouted for his A.D.M.S. Sanitation, Major Bagshaw, and said: "Bagshaw, Major Purdy says the Australian Camp at Mena was grossly insanitary." I said: "I did not say 'grossly,' but we can let it go at that."

Bagshaw said: "Well! they had only themselves to blame," to which I replied: "The site was chosen before ever the Australians reached Egypt," to which he replied: "Your Colonel Ryan" (who was A.D.M.S., A.I.F., on our arrival in Egypt) "went out to Mena and certified that the site was all right."

As the result of my report, which recommended the use only of the higher ground beyond the headquarters of the C.R.A., the territorial troops were not camped on the flats and at first enjoyed good health.

Later, however, an English general asked why the troops were not on the lower ground, and on being told that a medical officer had condemned it, replied: "Damn the medical officer," and unfortunately camped some troops on the old area. Subsequently, as was the case with the Australians, there were outbreaks of tonsillitis and pneumonia.

As a matter of fact, in the winter of 1915, the vicinity to the rear and west of Mena House, was actually under water.

The troubles in Egypt among the A.A.M.C. arose from there not being someone definitely with authority to act for Colonel Howse whilst he was at Gallipoli. Those who served with Sir Neville Howse knew him as a man decisive, impressive, uncompromising, conscious of an objective and capable of its attainment—above all, a very gallant gentleman.

Colonel Springthorpe, an enthusiastic, well meaning, energetic, capable physician, if he will excuse me saying so, never took kindly to the routine of army methods and discipline.

As Brigadier-General Plumer (now Field Marshal Lord Plumer) said on farewelling the 4th Q.I.B.'s at Piet Retief in South Africa in April, 1901: "Soldiering is an art that is not learnt in a day. It takes much careful training and, above all, discipline, to make an efficient soldier."

Many of our medical officers, even of senior rank, had no previous experience of army administration. This was well illustrated by ignorance of correct channels of communication, of war establishments and King's Regulations, the last ever a bugbear to men like our good friend, Colonel Springthorpe, whose heart, ever sensitive to the conditions of the men and his patients, sometimes overruled his head.

It was difficult for the Colonel and others to realize even the limitations in authority of an A.D.M.S. only

responsible for a division, or the difference even between A.A.M.C. equipment, Red Cross stores or grants from the Comforts Fund.

In spite of what anyone may say, the eulogium, "one of the best Directors of Medical Services at the War," is undoubtedly the general opinion both of the combatant staff and the A.A.M.C. as to Sir Neville Howse's part in the world war.

Yours, etc.,

J. S. PURDY,
Lieutenant-Colonel, A.A.M.C.R.

Sydney,
February 19, 1931.

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SIR: Although the indignation aroused by Dr. Springthorpe's letter is easily understood, a grave injustice will be done both to him and ourselves if the letter is not more closely analysed than has been done. It seems to me, with all submission to the difficulties of the position, that very wrong deductions have been drawn.

The letter, as I read it, was a sincere attempt to refute a statement in "The Medical History" that Dr. Springthorpe believed to be untrue, to do which he has every right, right that is not lessened in any way by the death of the individual involved—Sir Neville Howse—for reasons that I will give later.

The letter was prompted, not by the death of Sir Neville Howse, but by the publication of "The History"; the conditions under which it was set out and the purpose for which it was written were given; and the obloquy that might naturally follow was, as shown in the letter, anticipated by him.

The fact of publication in our journal by ourselves is in itself a credential of faith which, having given, we should have the grace not to allow any taint of impeachment of motive to soil without close deliberation.

The statement in point is "that Sir Neville Howse was one of the best Directors of Medical Services at the war," the importance of which is not whether he was or was not, of which there cannot be absolute proof one way or other, but that it is present in and forms part of "The Medical History." This is the primary cause of the controversy and its investigation may demonstrate the lesson the letter teaches.

"The Medical History" is a national work for the purpose of recording in the national archives the part played by the medical service in the war. It is a public history—a public or official record—and as such should contain only irrefutable statements—statements of established historical fact as opposed to statements of personal opinion. The mark of it should be its reliability; if not authoritative, it has no value as a public record and this happens immediately personal opinion creeps or walks in—opinion implies doubt, it even denotes it, it is practically doubt itself and doubt should find no place in any official record.

As a statement of fact it would be stamped with the authority of truth and would be put to the several uses it should, and if from apathy, expense or any other cause it is not thought worth while to make it a statement of fact, then, if it is to be considered as a public history, it is not worth while studying and consequently not worth while writing. Its only interest would lie in its literary worth and in the worth of its author's and his communicators' personal opinions, interesting as they might be in the opinion again of the reader, but as a public record it would be comparable to a history of the present economic depression arrived at and written under similar conditions.

Every way it is looked at, the insertion of the statement Dr. Springthorpe complains of is improper. Amongst other things, it indicates that the historian considers not only that he possesses the ability to measure the merit of all the directors of medical services engaged in the war, but the right to publish their comparative degrees of merit and the advisability of doing so in part.

If this ability and right and advisability be conceded, both morally and legally, then criticism of both the living and the dead is permissible and must follow, with the result that reputations and characters for the purpose add to the evils of the war. In this light, if it be light, the attack in the letter is on the reliability of "The History" and not on the individual, in which case the historian becomes the provoker, the reliability of the history becomes the contention, the bone of which most unhappily is Sir Neville Howse's military reputation and character.

But whatever the right, there can be no question of the impropriety. Disparagement of service or military character, direct or indirect, as in this instance, by historian or critic, should not be allowed; enlistment never anticipated it and public sense of the fitness of things should never tolerate it.

It is the medical organization and service as a machine that is wanted, the machinery itself, its structure, its working principles and its applications, not the individuals who drove or oiled or greased or repaired its component parts. Personal opinions of the machine and its parts and personnel, of lessons learnt through the war, of plans of preparation for future wars and all such like are not public history, even if they are history at all, and should not be found in a public history.

Nor is praise. To extol ourselves or certain ones of ourselves in a work written for ourselves and paid for by ourselves, made as it were to order, would carry no more recommendation here than anywhere else.

In conclusion, may I say in the event of any wrong inference in this letter having been drawn as to the plan and form of Colonel Butler's work, that since reading the controversy—on account of absence from home, the several copies of the journal reaching me at the one time—opportunity has not permitted of the purchase and reading of the book. The inferences drawn are from the statement itself, the knowledge that "The Official History of the War" was being used as a book of reference in the preparation of this history and the allusions in Dr. Springthorpe's letter to praise and blame and future lessons.

Yours, etc.,

H. E. JACKSON.

Bendigo, Victoria,
February 23, 1931.

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## DR. CHISHOLM ROSS.

A MEETING of medical practitioners was held at the British Medical Association House, 135, Macquarie Street, Sydney, on February 12, 1931, SIR ALEXANDER MACCORMICK in the chair.

The meeting was called with the object of providing medical practitioners with an opportunity of expressing sympathy with Dr. Chisholm Ross. On the motion of Dr. R. Scot Skirving, seconded by Dr. Cecil Purser, and supported by several other speakers, a resolution was carried expressing sympathy with Dr. Chisholm Ross in the position in which he recently found himself and assuring him of the confidence of those present. It was further resolved that a letter be dispatched to the Honorary Secretary of the New South Wales Branch of the British Medical Association requesting permission to publish the resolution in the public press.

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# Proceedings of the Australian Medical Boards.

## VICTORIA.

THE undermentioned have been registered under the provisions of Part I of the *Medical Act*, 1928, of Victoria, as duly qualified medical practitioners:

Beveridge, William John, L. *et* L.M., C.P. *et* S., 1896 (Ireland), Repatriation Department, St. Kilda Road, Melbourne.

Dixon, Francis Wilfrid Peter, M.B., B.S., 1930 (Univ. Melbourne), Saint Vincent's Hospital, Melbourne.

### TASMANIA.

The undermentioned have been registered under the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

O'Brien, Augustine Byrne, L.R.C.S., L.R.C.P. (Edinburgh), L.F.P.S. (Glasgow), 1929, Hobart Hospital, Hobart.

Martin, Hugh Henry, M.B., B.S., 1927 (Univ. Melbourne), Campbell Town.

## Books Received.

THE THEORY OF OBSTETRICS, by M. C. De Garis, M.D.; 1930. London: Baillière, Tindall and Cox. Demy 8vo., pp. 284. Price: 12s. 6d. net.

PRACTICAL MEDICINE SERIES: GENERAL MEDICINE; Series 1930. Chicago: The Year Book Publishers. Crown 8vo., pp. 848. Price: $3.00 net.

PRACTICAL MEDICINE SERIES: THE EYE, EAR, NOSE AND THROAT; Series 1930. Chicago: The Year Book Publishers. Crown 8vo., pp. 568. Price: $2.50 net.

LEGAL MEDICINE AND TOXICOLOGY, by Ralph W. Webster, M.D., Ph.D.; 1930. Philadelphia and London: W. B. Saunders Company; Melbourne and Christchurch: James Little. Royal 8vo., pp. 862, with illustrations. Price: 50s. net.

THE PRINCIPLES OF EPIDEMIOLOGY AND THE PROCESS OF INFECTION, by C. O. Stallybrass, M.D., D.P.H.; 1931. London: George Routledge and Son Limited. Royal 8vo., pp. 708. Price: 30s. net.

HOW IT HAPPENED, by Adalbert G. Bettman, M.D., F.A.C.S.; 1931. Philadelphia: F. A. Davis Company. Crown 8vo., pp. 110. Price: $1.00 net.

SEASONAL VARIATION IN MAN (A THEORY), by Edmund Hughes; 1931. London: H. K. Lewis and Company Limited. Crown 8vo., pp. 134, with illustrations. Price: 6s. net.

PYE'S SURGICAL HANDICRAFT; Tenth Edition; Edited by H. W. Carson, F.R.C.S.; 1931. Demy 8vo., pp. 659, with illustrations. Price: 21s. net.

## Medical Appointments.

Dr. L. S. Duke (B.M.A.) has been reappointed Government Medical Officer, Norfolk Island, for a period of three years from September, 1931.

* * *

Dr. C. S. Lawrence (B.M.A.) has been appointed Acting Government Medical Officer, Norfolk Island, for a period of two years.

* * *

Dr. C. Ross (B.M.A.) has been appointed Consulting Psychiatrist at the Reception House, Darlinghurst, New South Wales, until June 30, 1931.

* * *

Dr. H. D. Phipps (B.M.A.) has been appointed Medical Officer of Health by the Wiluna Road Board, Western Australia.

* * *

Dr. W. P. White (B.M.A.) has been appointed Medical Officer of Health by the East Fremantle Municipal Council, Western Australia.

* * *

Dr. H. B. Skinner (B.M.A.) has been appointed Medical Inspector of Seamen pursuant to the provisions of Section 123 of the *Navigation Act*, 1912-1926.

## Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi.

PERTH HOSPITAL, PERTH, WESTERN AUSTRALIA: Junior Resident Medical Officers.

ST. MARGARET'S HOSPITAL FOR WOMEN, SYDNEY, NEW SOUTH WALES: Pathologist.

SYDNEY HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Clinical Assistant.

THE BRISBANE AND SOUTH COAST HOSPITALS BOARD: Resident Medical Officer.

## Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

| BRANCH. | APPOINTMENTS. |
|---|---|
| NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney. | Australian Natives' Association.<br>Ashfield and District United Friendly Societies' Dispensary.<br>Balmain United Friendly Societies' Dispensary.<br>Friendly Society Lodges at Casino.<br>Leichhardt and Petersham United Friendly Societies' Dispensary.<br>Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney.<br>North Sydney Friendly Societies' Dispensary Limited.<br>People's Prudential Assurance Company, Limited.<br>Phœnix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | All Institutes or Medical Dispensaries.<br>Australian Prudential Association Proprietary, Limited.<br>Mutual National Provident Club.<br>National Provident Association.<br>Hospital or other appointments outside Victoria. |
| QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane. | Members desiring to accept appointment in ANY COUNTRY HOSPITAL, are advised to submit a copy of their agreement to the Council before signing, in their own interests.<br>Brisbane Associated Friendly Societies' Medical Institute.<br>Mount Isa Hospital.<br>Mount Isa Mines. |
| SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide. | All Lodge Appointments in South Australia.<br>All Contract Practice Appointments in South Australia. |
| WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth. | All Contract Practice Appointments in Western Australia. |
| NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington. | Friendly Society Lodges, Wellington, New Zealand. |

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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